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EDITORIAL INDEX—PAGE 119 BUYERS' DIRECTORY—PAGE 97 ADVERTISING INDEX—PAGE 120

CANADIAN MACHINERY AND MANUFACTURING NEWS

A weekly newspaper covering in a practical manner the mechanical power, foundry and allied fields.
Published by the MacLean Publishing Company, Limited, Toronto, Canada

Vol. XXI. No. 22. Publication Office: Toronto, May 29, 1919 Subscription Price $3.00 per Year

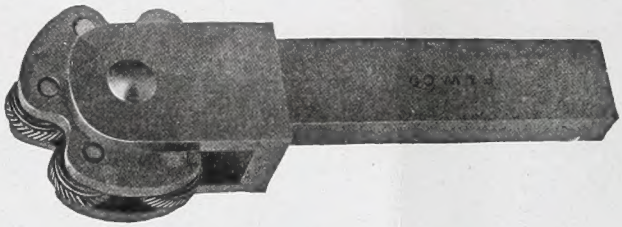
The John Bertram & Sons Co., Limited

DUNDAS, ONT., CANADA

Montreal - - - - 723 Drummond Building
Toronto - - - - - - 1002 C.P.R. Building
Vancouver - - - 609 Bank of Ottawa Bldg.
Winnipeg - - - - 1205 McArthur Building

SMALL TOOLS

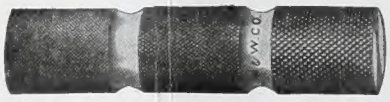
P. & W. Combination Lathe Knurling Tool



Combines Three Distinct Knurling Tools In One

You will save time by using this three-in-one Lathe Knurling Tool.

It carries three pitches of knurls fine, medium and coarse, as shown in sample. This does away with necessity of having three holders or of changing knurls where but one holder is available. Same knurls can be used in this holder as are used in our regular Lathe Knurling Tool.



FINE MEDIUM COARSE

Regular Lathe Knurling Tool

PROMPT SERVICE

is assured at our present store where P.W. Small Tools are carried in stock. Place your order there to-day.

Precision Machine Tool---Standards & Gauges

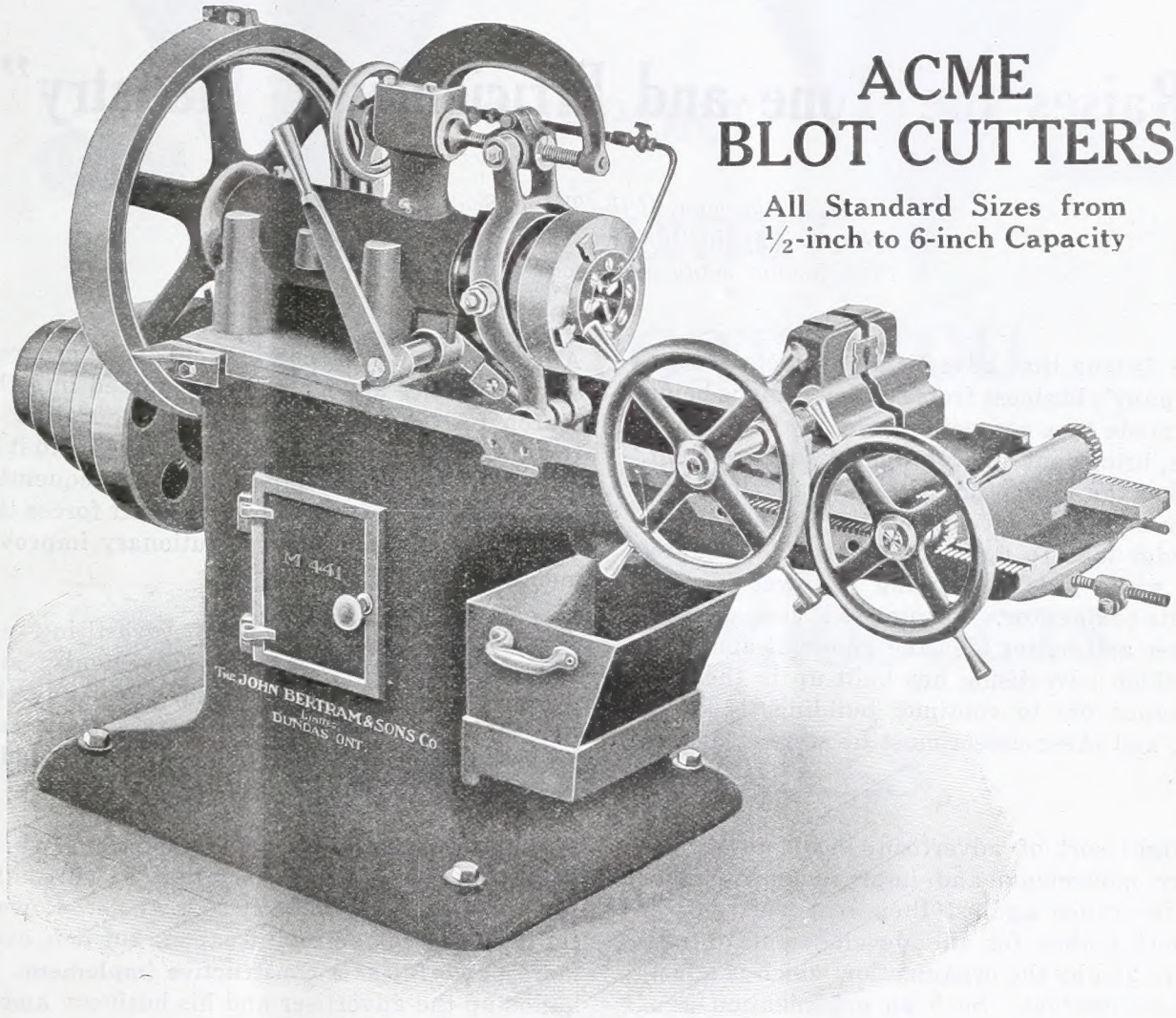
PRATT & WHITNEY CO.

OF CANADA, LIMITED

Works: DUNDAS, ONTARIO

MONTREAL	TORONTO	WINNIPEG	VANCOUVER
723 Drummond Bldg.	1002 C.P.R. Bldg.	1205 McArthur Bldg.	B.C. Equipment Co.

BERTRAM MACHINE TOOLS



ACME BLOT CUTTERS

All Standard Sizes from
½-inch to 6-inch Capacity

Supplied with Leadscrew Attachment for Stay Bolts or other work requiring special Accuracy of Pitch.

WRITE US FOR FULL DETAILS ON ANY MACHINE
OR MACHINES IN WHICH YOU ARE INTERESTED

The John Bertram & Sons Company Limited

DUNDAS, ONTARIO, CANADA

MONTREAL	TORONTO	VANCOUVER	WINNIPEG
723 Drummond Bldg.	1002 C.P.R. Bldg.	609 Bank of Ottawa Bldg.	1205 McArthur Bldg.

The Publisher's Page

TORONTO MAY 29, 1919

"Raises the Tone and Efficiency of Industry"

Mr. H. J. Sherman, of the Toledo Scale Co., Toledo, Ohio, writing in "Printer's Ink," issue of May 8, 1919, among many other good things, says:—

"IT is true that advertising protects a company's business from sudden inroads being made by a competitor who, by a stroke of genius, brings out a revolutionary improvement. It makes the marketing of any established product more stable. It enables the company with the older idea to fight for its crown of supremacy while it is developing a newer idea to meet its competitor. But unless it does develop a newer and better idea the goodwill and position which advertising has built up in the past and endeavors to continue building, is swept away, and these assets must be written off the books.

The right sort of advertising leads to revolutionary movements and improvements, rather than insurance against them. Advertising of this sort makes for the development of new ideas in and by the organization which is advertising its product. Such an organization is of necessity a progressive one. It is constantly on the lookout for new angles and viewpoints to incorporate in its copy, new ideas and improvements to broaden its market. Such an organization very often has its own corps of inventors and engineers working on new ideas.

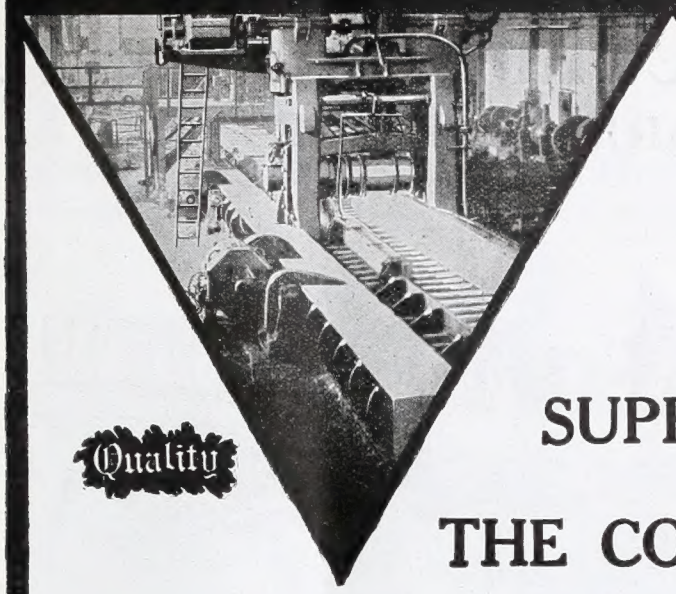
At the same time the competitors of the progressive advertiser are more or less forced into the search for new ideas, and the inauguration of revolutionary movements. They have to do it in order to remain as competitors. Consequently, advertising on the other fellow's part forces the competitor to work out revolutionary improvements in self-defense.

Advertising is progressive. Advertising encourages inventions and improvements, and increases the market for them. Probably the fact that a company advertises gives it first call on the ideas of inventors who are working independently.

Perhaps we might add as another thing which advertising will do the fact that it will make for progress in the industry as a whole. Powerful it is as a competitive weapon, but it is even more powerful as **a constructive implement.** It builds up the advertiser and his business, and it forces those who are to remain as his competitors to work on a sounder, more progressive basis. It raises the tone and efficiency of the industry and gives it a higher standing and character. Of course, the advertiser profits most, but the entire field profits as well."

Everyone profits by good advertising—every reader, superintendent, mechanic and apprentice, keeps thoroughly acquainted with new ideas in equipment through the advertising pages of CANADIAN MACHINERY.

Canadian Machinery and Manufacturing News, May 29th, 1919. Vol. 21, No 22. Published weekly at 143-153 University Ave., Toronto, Canada. Subscription price in Canada, $3.00; United States, $3.50. Entered as second-class matter at the Post Office Department, Ottawa, Canada. Entered as second-class matter July 1, 1912, at the Post Office at Buffalo, under the Act of March 3rd, 1879.



Quality

Service

SUPPORT

THE COUNTRY

THAT SUPPORTS YOU

If you consider your personal interests—the interests of your family and the community in which you live, you will

PURCHASE THE PRODUCTS

OF

CANADIAN MILLS

A Canadian Dollar
is Worth One Hundred Cents
in Canada

THE

STEEL COMPANY

OF

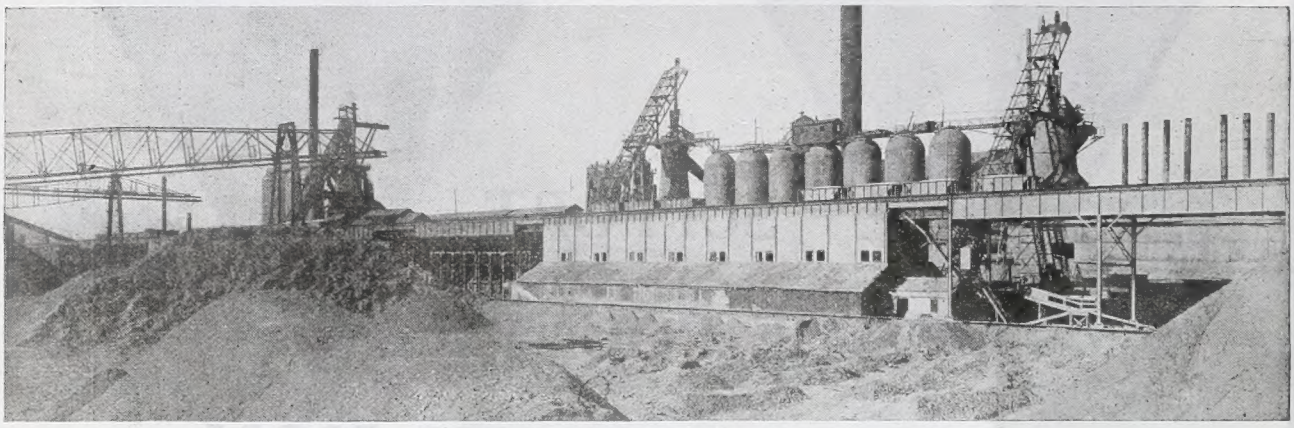
CANADA

LIMITED

HAMILTON - - MONTREAL

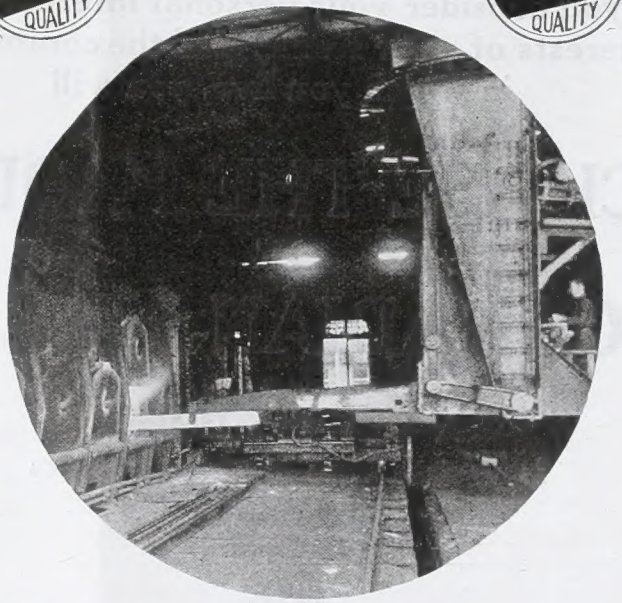
ALGOMA STEEL CORPORATION, LTD.

SAULT STE. MARIE, ONTARIO



BLOOMS,
BILLETS,
SLABS,
STRUCTURAL
STEEL
MERCHANT
BARS
CONCRETE
REINFORCING
BARS
IRON, BRASS
AND BRONZE
CASTINGS

MARK OF ALGOMA O.H. QUALITY

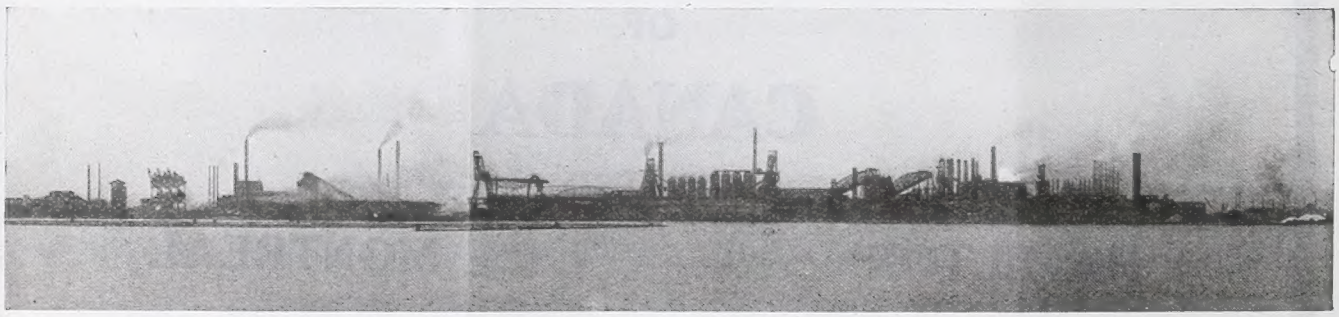


MARK OF ALGOMA O.H. QUALITY

Charging and Withdrawing Crane

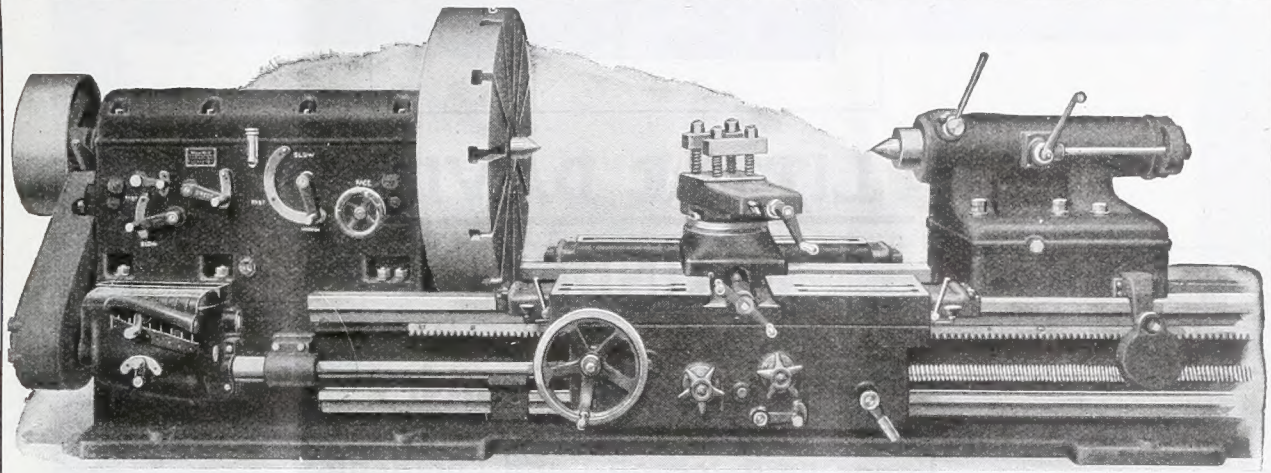
Sulphuric Acid. Nitre Cake

STEEL
RAILS
Open Hearth Quality
(All Sections from 12 lbs
to 100 lbs per yard)
SPLICE
BARS
STEEL
TIE PLATES
PIG IRON
BASIC, FOUNDRY-
BESSEMER
SULPHATE OF
AMMONIA



GENERAL VIEW OF THE PLANT OF THE ALGOMA STEEL CORPORAT ION FROM THE WATERFRONT

BRIDGEFORD



VALUE

Not the price you pay, but the years of service you get, determines a lathe's cost. The production you get and economy of operation and maintenance are determining factors.

You might buy a lathe at an extremely low price and in doing so pay dearly each month you run it. On the other hand, if you invest a little more money in a Bridgeford lathe you reduce cost of production and eliminate expensive repairs.

Distribute the difference in cost between a real machine built for service and one built to sell at a price and figure out how many times you would pay the difference in what it might appear you have saved.

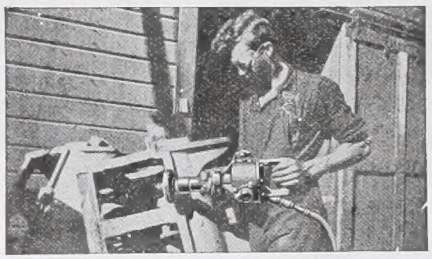
Just one point for your consideration—Bridgeford Lathes have* all steel gears. *There are numerous other features you should know about.

Send for our Catalogue

BRIDGEFORD MACHINE TOOL WORKS 161 Winton Road Rochester, N. Y.

Manufacturers of Heavy Duty Lathes for more than 20 years

BRIDGEFORD



"LITTLE DAVID"

GRINDER

Useful in the Foundry

Canadian Ingersoll-Rand Company Limited

Sydney Sherbrooke Montreal Toronto Cobalt
Winnipeg Nelson Vancouver

Swedish Steel & Importing Co., Limited

Montreal New York Toronto Denver

Direct representatives of foremost Swedish mills; makers of

Tool Steels

ALLOY STEELS, BILLETS, BARS, DISCS, SHEETS, HIGH SPEED STEELS, DRILL RODS, DRAWN BARS, SEAMLESS TUBING, COLD ROLLED STRIP STEEL, WELDING WIRE, WROUGHT AND ROLLED IRON, PIG IRON, STEEL AND IRON ENDS, HOLLOW AND SOLID MINING DRILL STEEL.

TRADE MARK SS "DOUBLE ESS"

PROMPT SHIPMENTS from large stock

WOLFRAM

MADE IN THE U.S.A.

HIGH SPEED STEEL TRADE MARK

A Keen Cutter

WOLFRAM Is Both

VULCAN CRUCIBLE STEEL CO. ESTABLISHED 1900 Aliquippa Pa: U.S.A.

Represented in Canada by Messrs Norton Callard & Company MONTREAL QUE.

Strong in the Neck

WILT

Machine shop foremen and superintendents who invariably specify **"WILT"** when requisitioning tools know **WILT Drills** are superior—are absolutely guaranteed against defective material and workmanship—are rigidly inspected before being shipped. To produce more, use **WILT Drills.** To produce more economically, use **WILT Drills.** Elimination of breakage alone will save you much.

HIGH SPEED AND CARBON TWIST DRILLS

WILT TWIST DRILL CO. OF CANADA, LIMITED

Walkerville, Ontario.

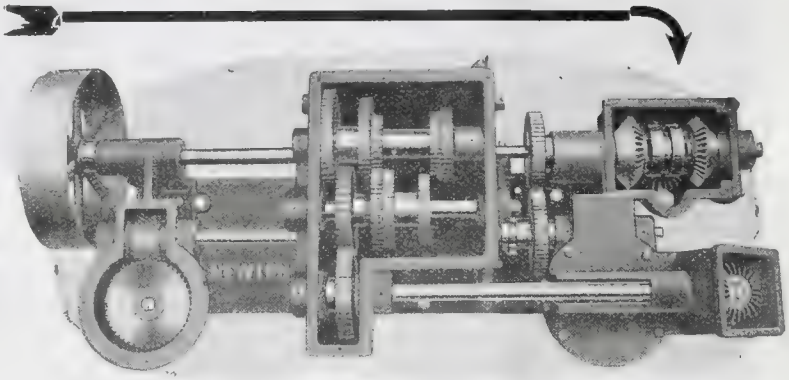
London Office: Wilt Twist Drill Agency, Moorgate Hall, Finsbury Pavement, London, E.C.2, Eng.

"Where there's a WILT —there's the Way."

THE JOHNSON FRICTION CLUTCH

OVER THERE

is incorporated in a nest of gears and controls the rail elevating on a NEWTON Four Spindle Milling Machine.



Courtesy of Newton Machine Tool Works, Philadelphia, Pa.

YOU SHOULD

incorporate clutches in your machine. Bear in mind that there is a JOHNSON FRICTION CLUTCH for every requirement. Follow our ads., not the machine tool builders who have adopted JOHNSON FRICTION CLUTCHES. Send us a blue print showing where you desire to use a clutch. We will then show you just what we would supply. This is a part of JOHNSON SERVICE. What are your requirements?

Our "Booklet "Clutches as Applied in Machine Building" and Yellow Data Sheets are Free

AGENTS: CANADA—Williams & Wilson, Montreal. The Canadian Fairbanks-Morse Co., Ltd., Montreal and Branches. ENGLAND—The Efandem Co., Ltd., 22 Newman St., Oxford St., London, W. 1, Sole Agents for British Isles. AUSTRALIA—Edwin Wood Pty., Hdwe. Chambers, 231 Elizabeth Street, Melbourne, Victoria. JAPAN—Andrews & George Co., 16 Takegawacho, Kiobashi-ku, Tokyo. SOUTH AFRICA—D. Drury & Co., Main St., Johannesburg. FRANCE—Anciens Etab. Glaenzer & Perreaud, 18 Faubourg du Temple, Paris.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

E&M

ELECTRIC

Steel Castings

High Grade STEEL Castings
Of Every Description

Prompt Deliveries

Send us your drawings for estimates.

THE ELECTRIC STEEL AND METALS COMPANY, LIMITED
WELLAND ONTARIO

G&G

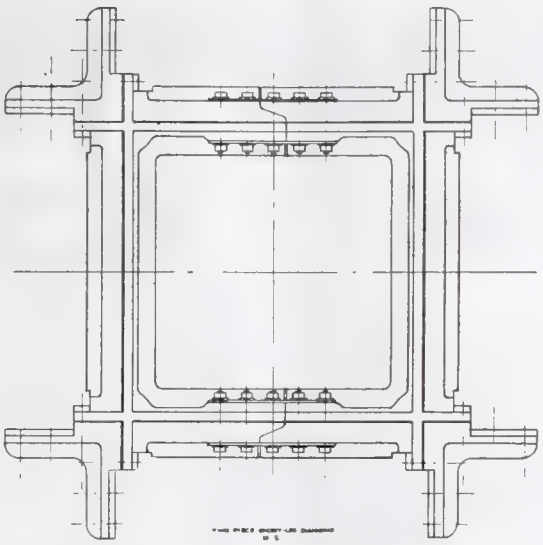
Forging Billets and Bars
Electric Furnace, Alloy Steels

Die Blocks
Annealed—Heat Treated

Piston Rods
Rough Turned—Annealed—Heat Treated

High Speed Steel

General Steel Company
Milwaukee, Wisconsin
DETROIT - 823 Dime Bank Building



TRACK WORK

for Steam & Electric Railways

SWITCHES · MATES · FROGS
CROSSES · DIAMONDS · ETC.
COMPLETE INTERSECTIONS

Built-up, Hard-Centre or Solid Manganese-Steel Construction

Manufacturers of Balkwill Articulated Cast Manganese Crossings.

CANADIAN STEEL FOUNDRIES, LIMITED

Transportation Building. Montreal

Electrite

Electric furnaces, automatically regulated, the most modern methods, and the **introduction of Uranium** — make this a steel of truly remarkable cutting properties.

We know "Electrite" cannot be bettered — and stand ready to prove it to you.

LATROBE
ELECTRIC STEEL CO.
LATROBE, PA.

High Speed Steel

Uranium

MacKINNON STEEL CO., LTD.

Engineers, Manufacturers and Erectors of Steel Structures

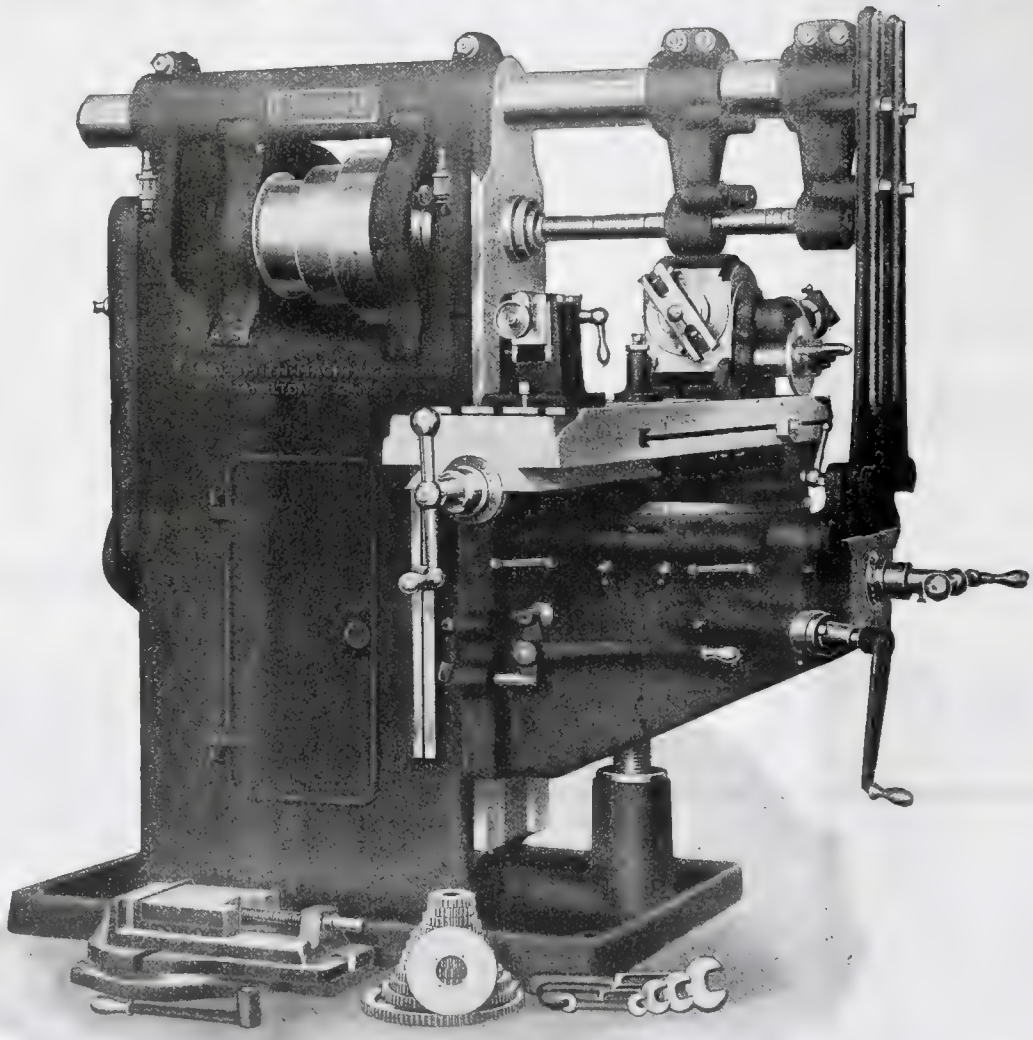
Industrial Bridges, Buildings, Towers, Smoke Flues and Stacks, Chutes, Coal Bins, Ore Bins, Tanks, Cranes, Engine Houses, Grain Elevators, Derricks.

Structural Steel and Steel Plate Work, and a combination of the two lines.

Prompt Deliveries Assured.

MacKINNON STEEL CO., LIMITED
Sherbrooke, Quebec
Montreal Office: 404 New Birks Building

FORD-SMITH MILLING MACHINES



PLAIN AND UNIVERSAL

These machines are accurate, strong and rigid, with well-balanced design to handle rapid and accurate production. **Made in four sizes.** Illustration shows Ford-Smith No. 3 Universal.

Our catalogue will interest you.

Agent for Great Britain: W. E. Storey, 3 Arundel St., London, Eng.
Agent for United States and Foreign Countries: Alfred Herbert, Limited, 54 Dey St., New York.

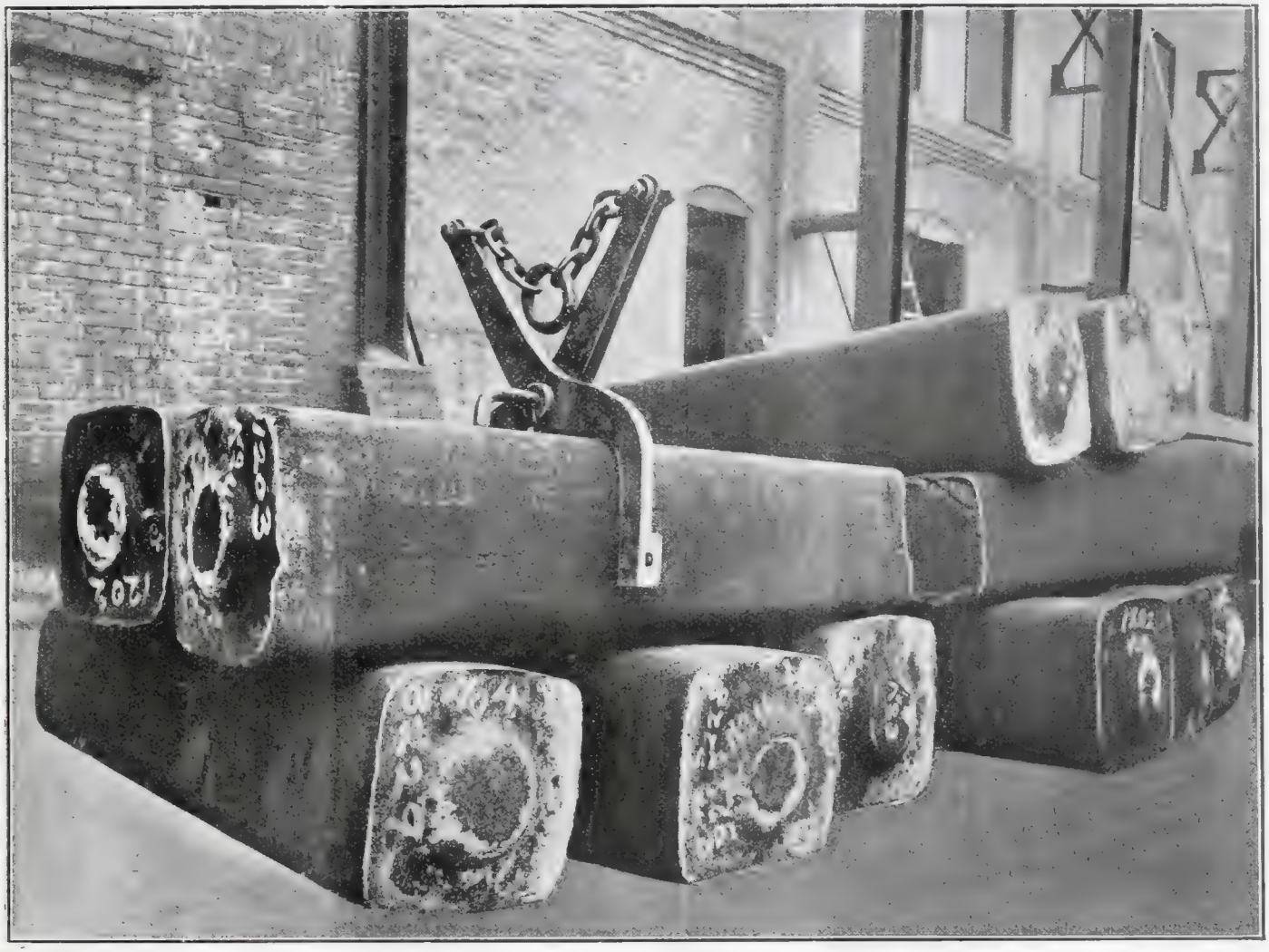
The Ford-Smith Machine Co., Limited, Hamilton, Ont., Canada

Makers of Milling Machines, Grinders and Special Machinery

Nova Scotia Steel & Coal Company

Limited

New Glasgow, Nova Scotia, Canada



THREE AND ONE-HALF AND FIVE-TON "FLUID COMPRESSED" STEEL INGOTS.

The Nova Scotia Steel & Coal Co., realizing the importance of "fluid compression" as a valuable aid in producing reliable and first-class steel products, procured by purchase the Canadian license from M. Harmet, of St. Etienne, France, whereby they own the sole rights in this Country to use his process. This they considered in accordance with their policy of taking advantage of every important metallurgical development, thus advancing with modern progress, and particularly that their high reputation as manufacturers of the best marine, railway and machine forgings obtainable should be maintained.

The "fluid compression" plant laid down at Sydney Mines, N.S., consists of one group of four Harmet presses, each of 1,250 tons and capacity to handle 3½ to 5-ton ingots; and one of 4,000 tons to handle ingots up to 30 tons.

The product of this process is used in the manufacture of high-grade forgings, such as locomotive axles, crank shafts, marine forgings, artillery tubes and armor plate of the highest grade; in fact for all commodities in which maximum reliability and homogeneity of structure enter and are demanded.

WAR is destructive. Peace is constructive. War has taught us many things, chief of which is the great value of Time. Time is the essence of your life and mine. Whatever saves Time, saves Life.

"Red Cut Superior"

The Nationally Known FIRST QUALITY

HIGH SPEED STEEL

Is the avowed Enemy of Waste and Inefficiency, and allied with Life. Save Time, Save Life

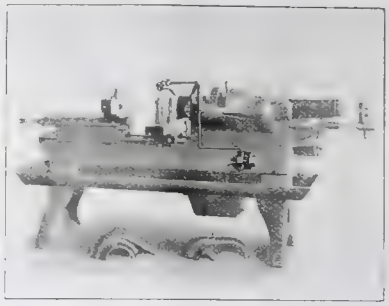
Are your Tools made of Red Cut?

VANADIUM-ALLOYS STEEL CO.

General Sales Offices, PITTSBURGH, PA.
Works, LATROBE, PA.

BOSTON
BUFFALO
CINCINNATI
CHICAGO
CLEVELAND
DETROIT
PITTSBURGH
MONTREAL
NEW YORK
TORONTO

TRAHERN LUBRICATING PUMPS



Screw Machine
W. K. Millholland Machine Co.

It does not take much reasoning to reach the conclusion that W. K. Millholland Machine Company would be very careful when selecting a pump to install on their product before its sale.

They would choose a pump which they had tried and knew to be dependable.

They would select the best type from the dozens which are being manufactured to-day.

They chose a TRAHERN, for they knew it would increase the efficiency of their machines.

A trial is all that is necessary to convince you that they are THE logical installation.

We'll Stand By You.--TRY ONE.

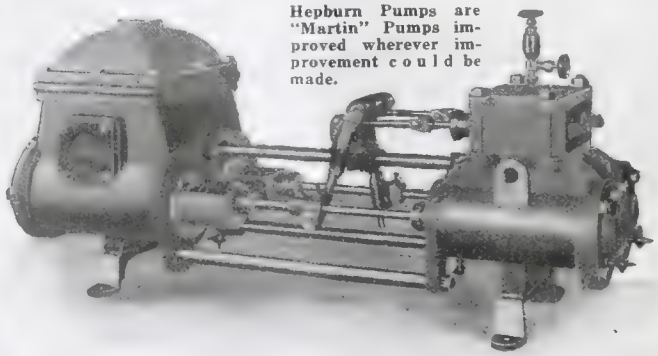
Trahern Pump Company
Rockford, Illinois.

Canadian Agents:
A. R. Williams Mchy. Co. - Toronto, Ont., Can.

Hepburn Pumping Machinery

Our line embraces standard duplex pumps for boiler feeding and for fire and general service; tank or low service duplex pumps; duplex hydraulic pumps for service in connection with hydraulic lifts and presses, accumulators and oil presses; pressure or mine pumps; horizontal power pumps and air and circulating pumps, etc.

Hepburn Pumps are "Martin" Pumps improved wherever improvement could be made.



JOHN T. HEPBURN, LIMITED
18-60 Van Horne Street Toronto, Ontario

CANADA
FOUNDRIES & FORGINGS
LIMITED

A SOLEMN WARNING

A flood of business will overwhelm this country inside of two months. Problems of supply must be met and faced squarely. Those firms who have courage are getting their supplies now. Those who are hesitating are going to receive an awful jolt when they finally decide to proceed with business, because it will be impossible to get service. They will then blame everybody but themselves. Our solemn warning is, "Don't blame us because you didn't see this vision."

Canada Foundries & Forgings, Limited
WELLAND, ONT.

Crucible
AND
Open Hearth Steel

Tool Steel

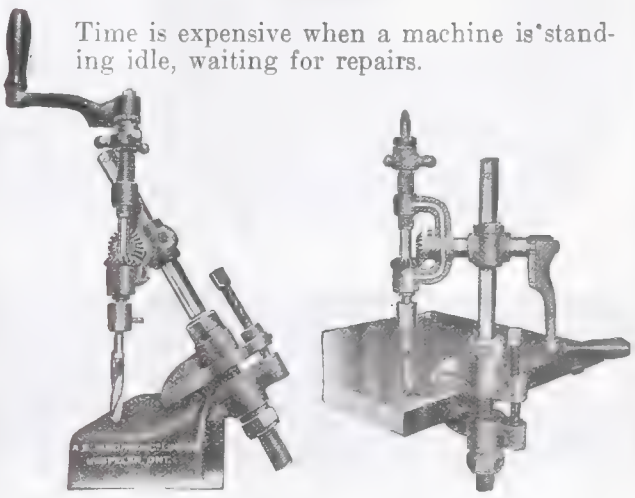
"ARGO" BRAND *HIGH-SPEED* **STEEL**

The John Illingworth Steel Co.
1856
Frankford, Phila.
New York Office 217 Broadway

RALPH B. NORTON, AGENT
Montreal, Canada

Jardine Universal Ratchet Drill

Time is expensive when a machine is standing idle, waiting for repairs.



On the average repair job, this machine completes the drilling in less than the time required to set an ordinary ratchet to begin.

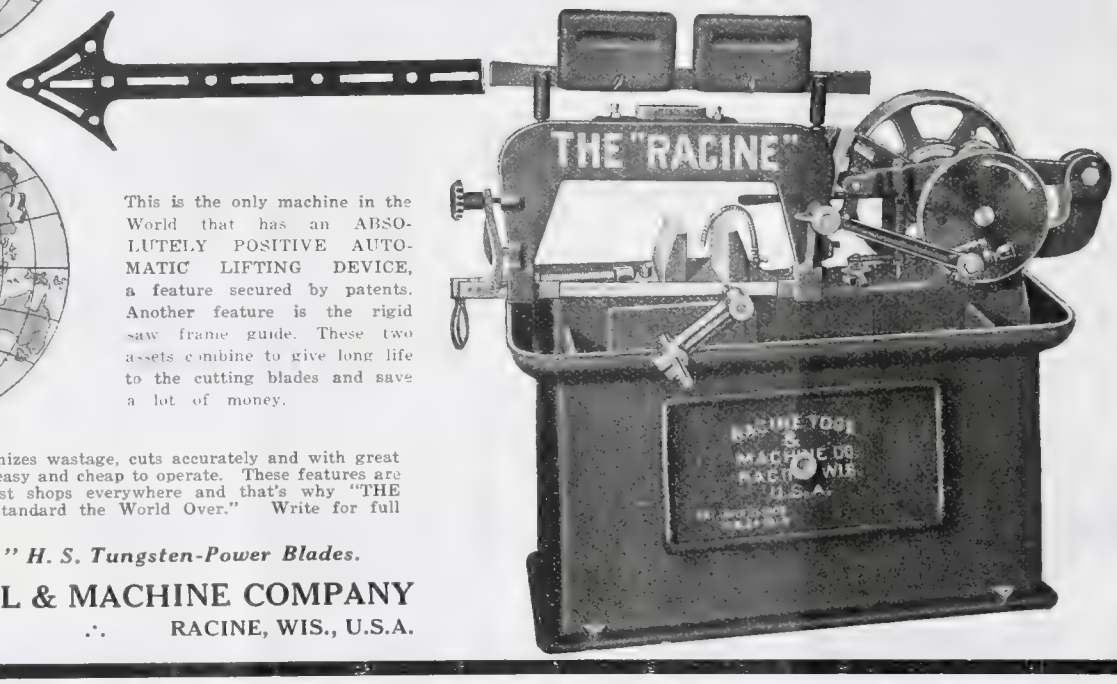
Weight, 40 lbs. Price, $26.50 net
Sold by all Machinery and Supply Houses

A. B. JARDINE & CO., Limited
HESPELER, ONTARIO

"THE RACINE"

High Speed Metal Cutting Machine

Standard the World Over



This is the only machine in the World that has an ABSOLUTELY POSITIVE AUTOMATIC LIFTING DEVICE, a feature secured by patents. Another feature is the rigid saw frame guide. These two assets combine to give long life to the cutting blades and save a lot of money.

"THE RACINE" minimizes wastage, cuts accurately and with great speed. Then they are easy and cheap to operate. These features are appreciated by the best shops everywhere and that's why "THE RACINE" sets the "Standard the World Over." Write for full particulars.

Use "RACINE" H. S. Tungsten-Power Blades.

RACINE TOOL & MACHINE COMPANY

Melbourne Ave. ∴ RACINE, WIS., U.S.A.

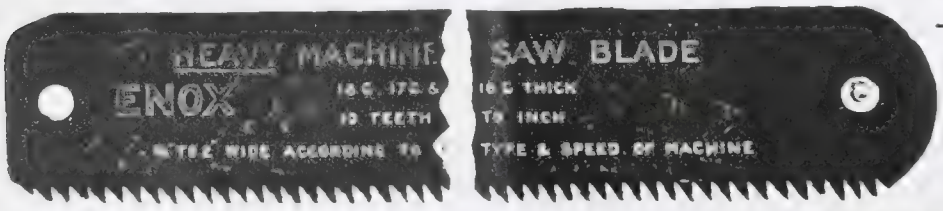
SIMONDS

HACK SAW BLADES

UNEQUALED IN QUALITY ANY SIZE OR LENGTH

Simonds Canada Saw Co. Limited

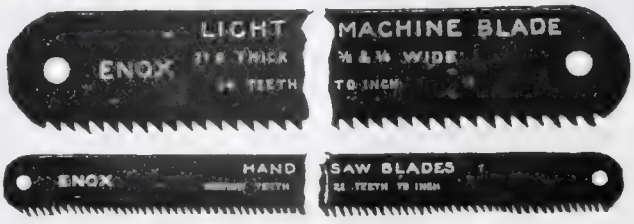
ST. JOHN MONTREAL VANCOUVER



ENOX

Hacksaw Blades

ARE THE BEST



AGENTS IN CANADIAN TOWNS WANTED

Liberal Terms offered to firms willing to carry stocks and act as sole agents for the district.

Makers:

FRY'S (LONDON) LIMITED

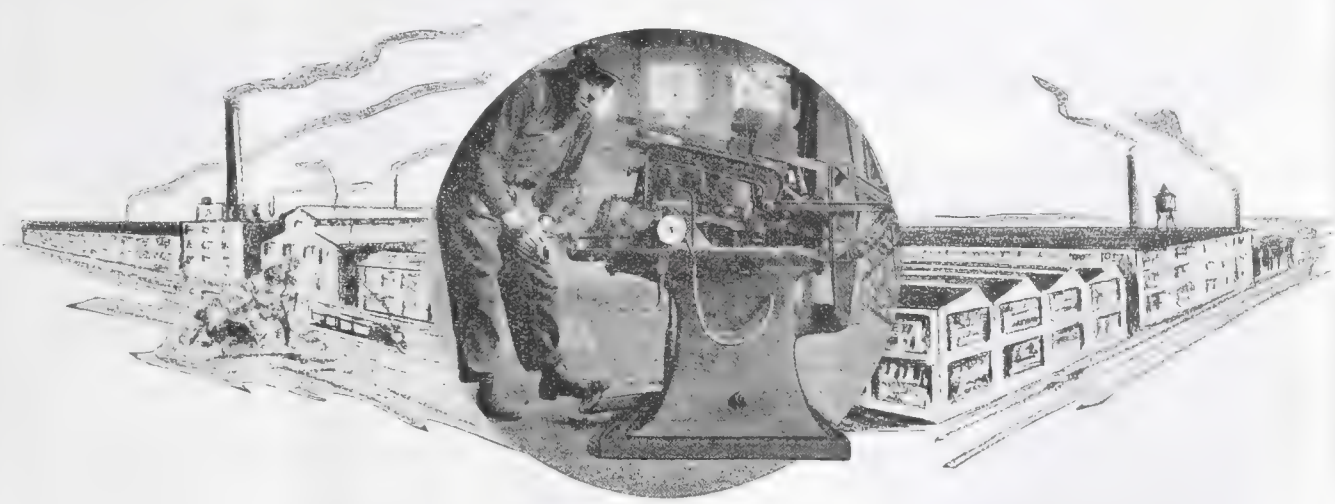
AN ENTIRELY BRITISH COMPANY

46 Upper Thames St., London, E.C. 4, England. Works: Greenwich, S.E. 10

Agents for Canada, East of Fort William

THE STANDARD MACHINERY & SUPPLIES, LIMITED, 261 Notre Dame St. West, MONTREAL, QUE.

Agents for British Columbia—The A. R. Williams Machinery Co., Limited, 495 Railway St., Vancouver, B.C.



Starrett Hack Saws

are more than just hack saws—each blade is a cutting tool specially designed to cut one or more kinds and shapes of metal most economically.

It's only a small shop with a wide range of miscellaneous work and very frequent changes that can afford to use one hack saw blade to cut every kind of metal.

The big concerns, cutting quantities of metal, work the Starrett way. They standardize by specializing because they've found it cheaper in cost per cut.

Follow the Starrett Hack Saw Chart 3 and watch your cutting costs go down.

The L. S. Starrett Company

Athol, Mass.

The World's Greatest Toolmakers

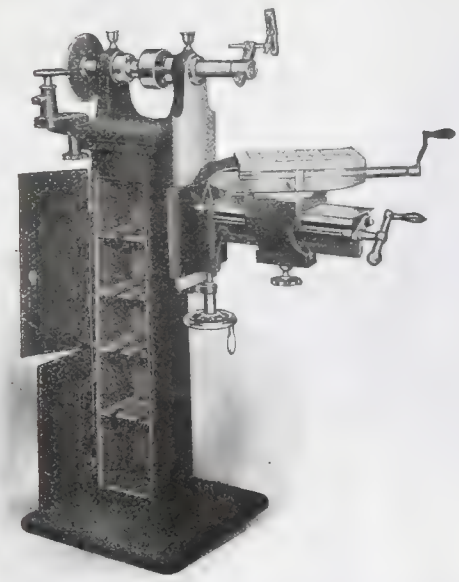
Manufacturers of Hack Saws Unexcelled

New York London Chicago

STARRETT HACK SAWS CUT QUICKER LAST LONGER

42-934

OBTAIN THE BEST RESULTS



GARVIN No. 3, Universal Cutter and Surface Grinder
Use Code—Banish

From Cutters and Tools Kept Sharp on

GARVIN No. 3 UNIVERSAL
CUTTER AND SURFACE GRINDERS

Simple **Light Running** **Accurate**

The spindle is hardened and ground and supported out close to the wheel by an extended bearing, and carefully protected from emery.

The knee and the yoke carried on the knee both have a large range of adjustment. On the knee yoke or carriage is mounted the swiveling table, which has a quick, sensitive movement by rack and pinion operated from end or side.

On this table is mounted the index head, and all the attachments are held in this head.

An outfit of emery wheels, mandrels, bushings, wrenches, etc., is supplied with the machine.

Machine is designed to keep its original factory accuracy.

CAPACITY: CUTTERS, 14" x 6"; SURFACES, 9½" x 6"

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THE GARVIN MACHINE COMPANY

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Rotary, self-feeding shears designed for cutting in and out curves, straight or irregular shearing, circles, also beveling and splitting of plates. Built in various sizes having capacities from tin up to ½" thick. No limit to the size of sheet being cut. Hand, belt or motor drives. The last word in metal cutting shears. We also manufacture Rotary Bevel Shears, Splitting Shears and Plate Milling Machines.

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Marshalltown Mfg. Co.

Marshalltown, Iowa
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Made to work quickly, conveniently, safely and easily —closed and opened by a slight twist of the key—

Jacobs Chucks

hold tools firmly and precisely and save time and labor. Wherever durable, reliable chucks are demanded there Jacobs Chucks are found.

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CHUCKS & MICROMETERS

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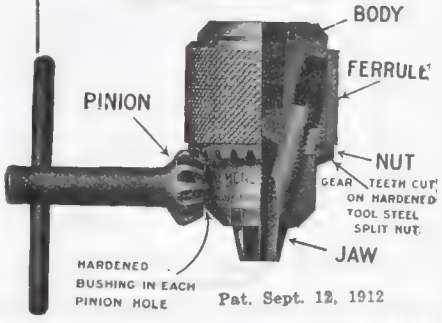

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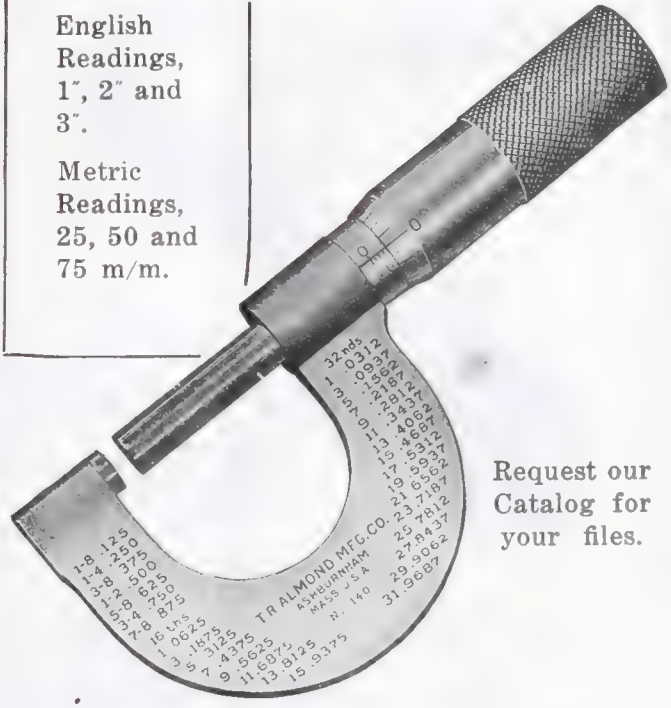

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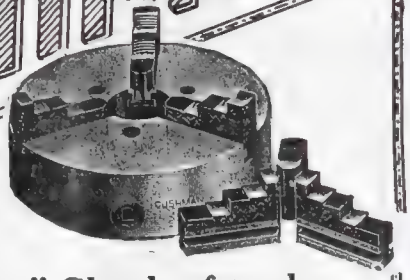
Cushman



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And right from the start in 1862, they have been known throughout the industry for their high quality Material and Workmanship.

The CUSHMAN Chuck of to-day embodies every up-to-date improvement of a long line of FAMOUS CHUCKS.

Send for our Catalogue showing complete line of Lathe Chucks, Drill Chucks and Portable Face Plate Jaws.

Cushman Chuck Co., Hartford, Conn.

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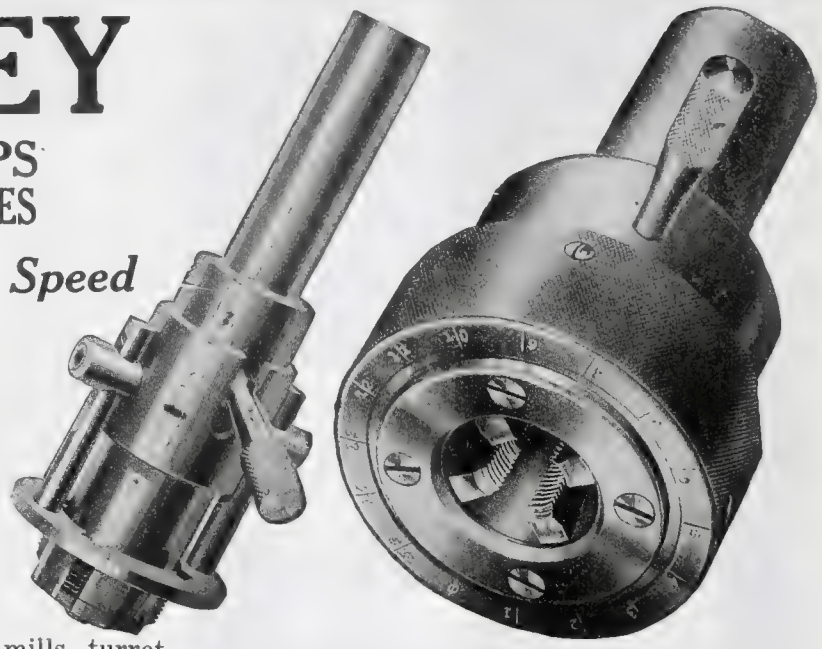
COLLAPSING TAPS and SELF-OPENING DIES

Promote Accuracy and Speed



MURCHEY Collapsing Taps and Self-Opening Dies are cleared free from the thread instantly, preventing all danger of stripping, besides cutting time for production in half. **Thus you are sure of greater accuracy and greater production.** Murchey Tools are speeding production in all parts of the country on tapping machines, drill presses, monitor machines, boring mills, turret lathes, and on all other machines to which taps or dies may be attached.

Let us know the class of work you are handling and we will show you how to increase your production 50 per cent. without running up the cost.

Murchey Machine & Tool Company, Detroit, Mich.

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Friction Chuck

not only prevents tap breakage but saves loss due to damaged parts and removing taps. It is the simplest Tapping Chuck made; it is the most efficient and fits any kind of machine. It can be used on multiple spindle drills or tapping machines, even when the spindles are close together.

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Die Head Cuts Perfect Threads

The H. & G. Die Head illustrated is only 3⅝" outside diameter, yet it will cut from the smallest up to 1" standard thread and up to 1⅛" fine threads. For absolute proof of its ability to stand up and give good results, see the perfect threads it cuts on nickel steel. You can see these many places, but in almost any automobile or aeroplane plant for certainty.

Made in 9/16", 1", 1½" and 2" sizes.

No stronger, more durable, more accurate Die Head was ever made.

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Eastern Machine Screw Corp.

New Haven - Conn.

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A Durable, Waterproof Roof for Your Factory

If you are going to build a new factory or re-roof an old building, it will pay you to investigate the merits of Brantford Roofing.

If the roof is flat, your roofing contractor can lay **Brantford Asphalt Roofing** or **Brantford Rubber Roofing** according to our Brantford Specification and give you a permanent, waterproof roof that will last for many long years.

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An Artistic Roof For the Home

Brantford Asphalt Slates, in red or green, make a beautiful roof for the home. They are fire-resistant, weather-proof and long-wearing.

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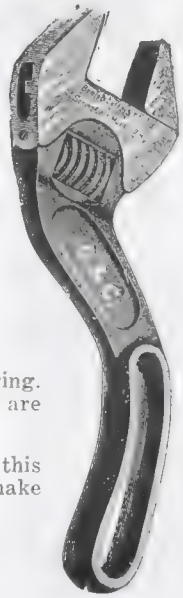
For trimming, stamping forging, punching, embossing.

Special presses are designed where the customer's requirements are unusual.

CONSOLIDATED POWER PRESSES

This is the
BEMIS & CALL
Never-Slip Wrench



It works in hard-to-get-at places—in places where a straight handled wrench could not be used. It is specially designed for pipe and nut work, and is easily operated and handled by one hand.

The sliding Jaw is a steel drop forging. The operating nut is steel. All parts are interchangeable.

All B. & C. Tools are as good as this Never-Slip Wrench—and we cannot make it better.

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Hardware & Tool Company
Springfield, Mass., U. S. A.

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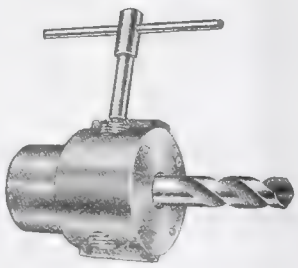

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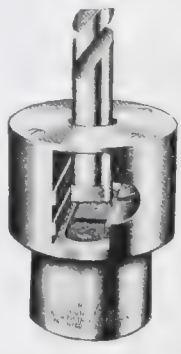
POSITIVE DRIVE DRILL CHUCKS

The Union Drill Chuck is made in seven sizes (0 to 2 inches) with PATENT TRANSVERSE SLOT—so that drills with tenons can be inserted (see illustration). The shank of drill should be squared on two sides to enter the TRANSVERSE SLOT, giving a positive rotation to the drill independently of the jaws, permitting the jaws to centre and align the drill accurately. The drill is held absolutely true and will not slip under the hardest strain. This type of chuck will be found to give the best of results on all classes of work from HIGH SPEED drilling to the hard BLACKSMITH and GENERAL REPAIR work.



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New Britain, Conn.

New York Office 26 Cortland St.

Makers of a complete line of chucks.

Williams' Superior Drop-Forged Wrenches

ARE unequalled where exacting service and dependable strength mean speed and efficiency.

There is as much difference in wrenches as in men:—power and worthiness in both are the fruit of careful, systematic development.

That's why the growth, for nearly half a century, of the Williams' Line stands for excellence in design and quality—that's why the words, "Standard" and "Superior," as applied to Williams' Drop-Forged Wrenches mean dependable service under the most severe conditions.

Every one of the 40 patterns in about 1,000 sizes, with openings from 3/16″ to 7 5/8″—*standard* in design and size for every recognized trade need—carries the Williams' guarantee.

When you specify "Williams' Wrenches," you ask for the best.

Our Wrench Booklet gives full particulars.

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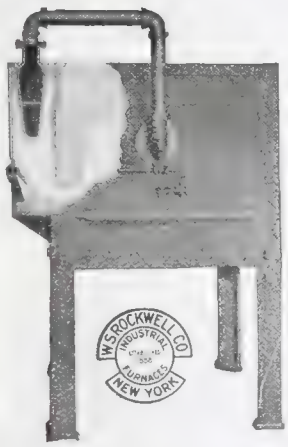

It is economical in fuel, air and power; protects workmen from flame and hot gases and the heated material from oxidation or scale; increases the quantity and improves the quality of heated products; prevents smoke, flame and heat escaping into forge shop.

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in all kinds of sheet metal. If you have any work of this kind let us quote you prices.

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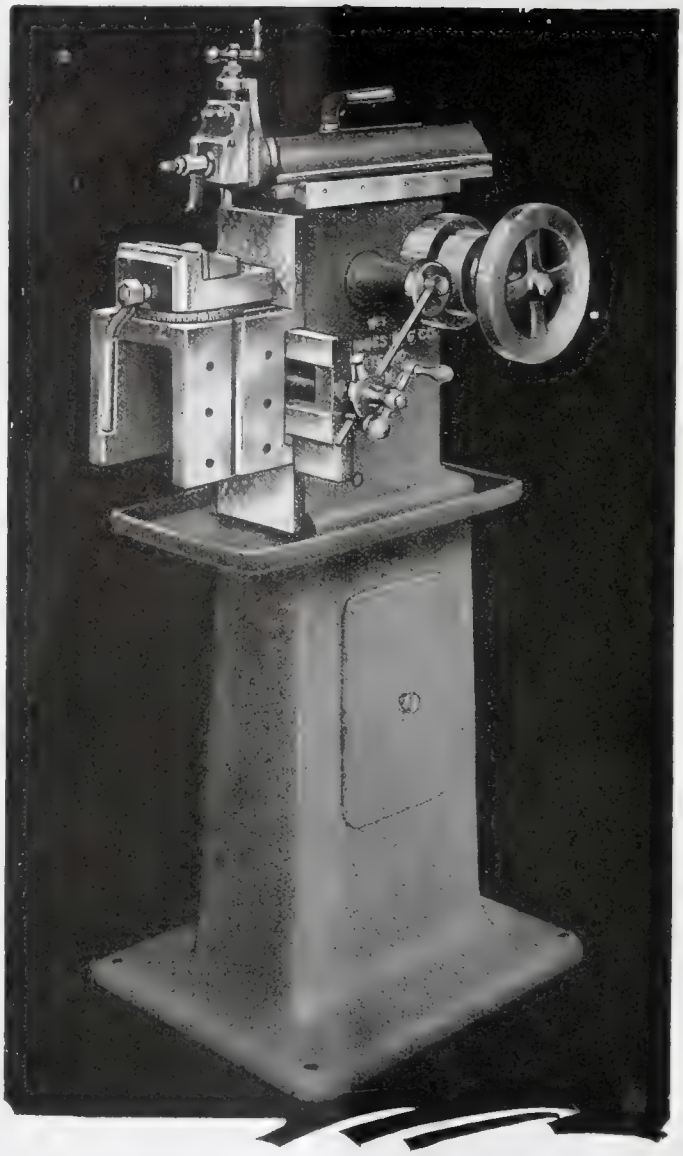

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Vertical and Horizontal Shaper Gives Maximum Efficiency at Minimum Cost

Don't do your shaping and slotting, tool-making, die-making, modeling and other classes of light work on big and expensively-operated machines when all this work can be done more accurately, quicker and cheaper by far, with the RHODES Machine. Being introduced all over the world on their cost-cutting merits.

They will increase your profits. Look into the matter. Write for description of various types—do it now.

The Rhodes Mfg. Co.
Owned and operated by the JACOBS MFG. CO.
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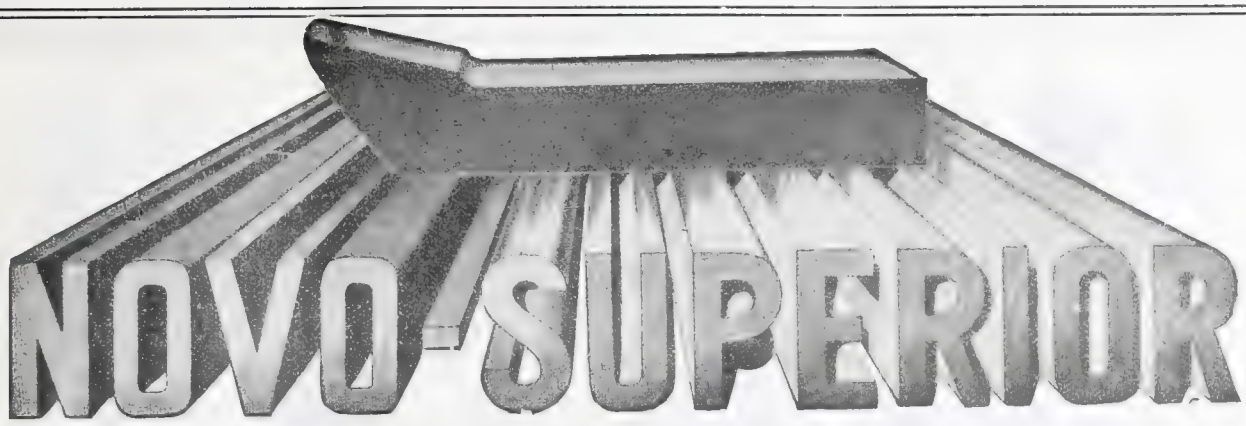

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Tool Steel for Every Purpose

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Reduces Cost of Production

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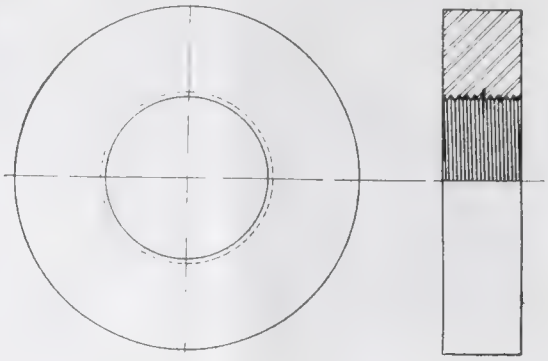
You have everything to gain—take advantage of our offer now.



The Proof in Detail

We herewith give a practical demonstration of the Smalley-General Thread Miller's work:
MACHINE—Smalley-General Thread Miller No. 2. Air collet chuck.
PIECE MILLED—Threaded collar.
THREAD—Diameter 2¾", length 1¼", 8 pitch thread U.S. standard.
LIMITS—.001.
MILLING FEED—25" per minute. Not limit of machine but of hob. Job also faced at same chucking.
MATERIAL—Machinery steel.

Smalley-General Company, Inc., Bay City, Michigan

Canadian Agents—Rudel-Belnap Co., Limited, Montreal and Toronto

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Hoyt Metals have been used with great success for many years.
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IMPERIAL GENUINE BABBITT METAL

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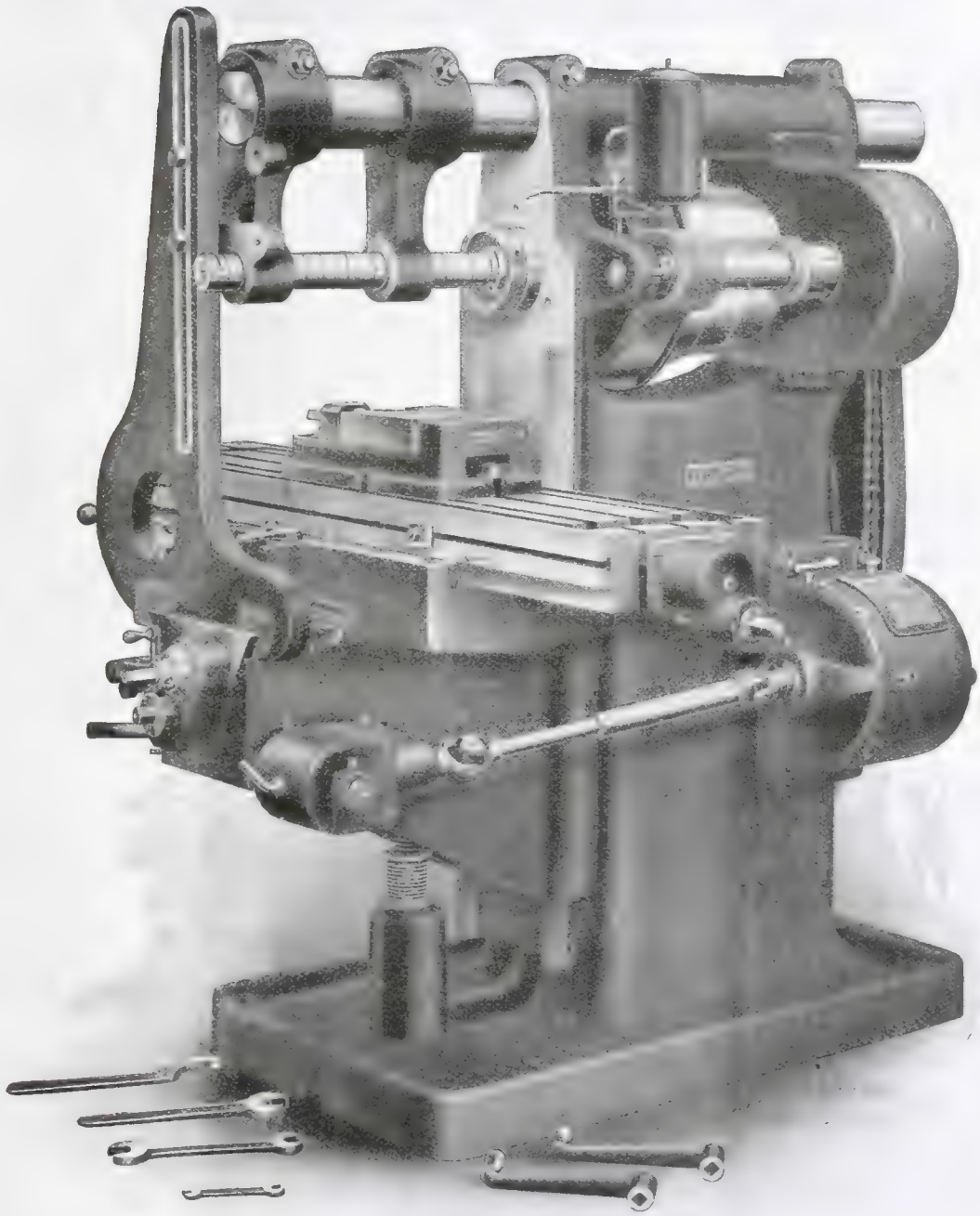
KEMPSMITH



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Double Back Geared.

A heavy, powerful tool with double back gears and wide driving belt running on a three-step cone of large diameter. Our catalogue "B" describes and illustrates many notable features of the Kempsmith Milled. Write for a copy to-day.

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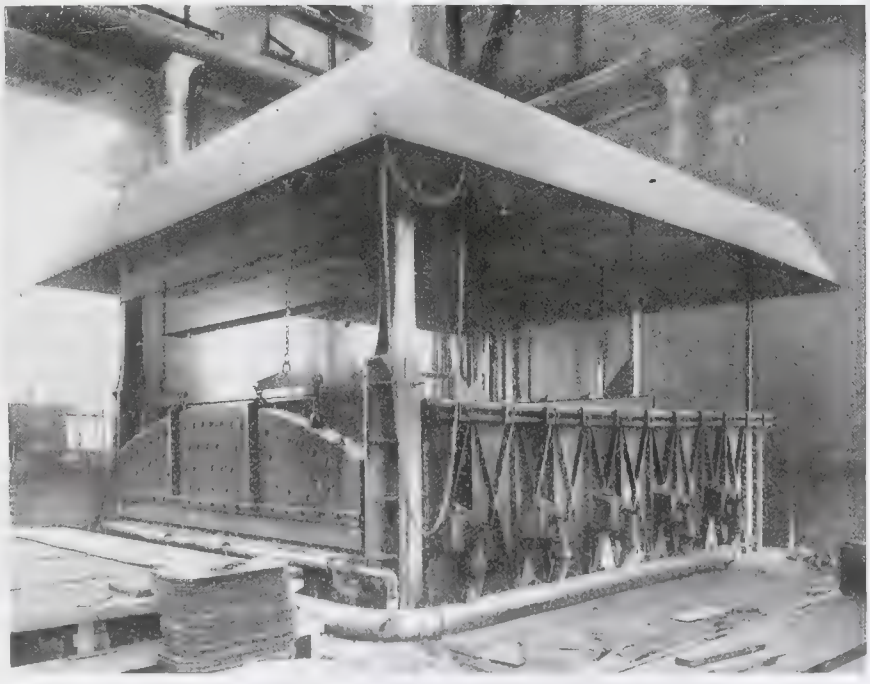

Any Size

Illustration shows a Plate Heating Furnace installed in the plant of Canadian Vickers Ltd., Montreal.

Your proposition, if out of the ordinary, would be bettered by our co-operation. Get in touch with us.

Mechanical Engineering Co., Ltd.
Room 308, Bank of Toronto Bldg., Montreal
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AUTOMATIC MILLING MACHINES

HORIZONTAL VERTICAL

EVERY working part of this machine is built with a view to **increased production.**

CONTINUOUS MILLING

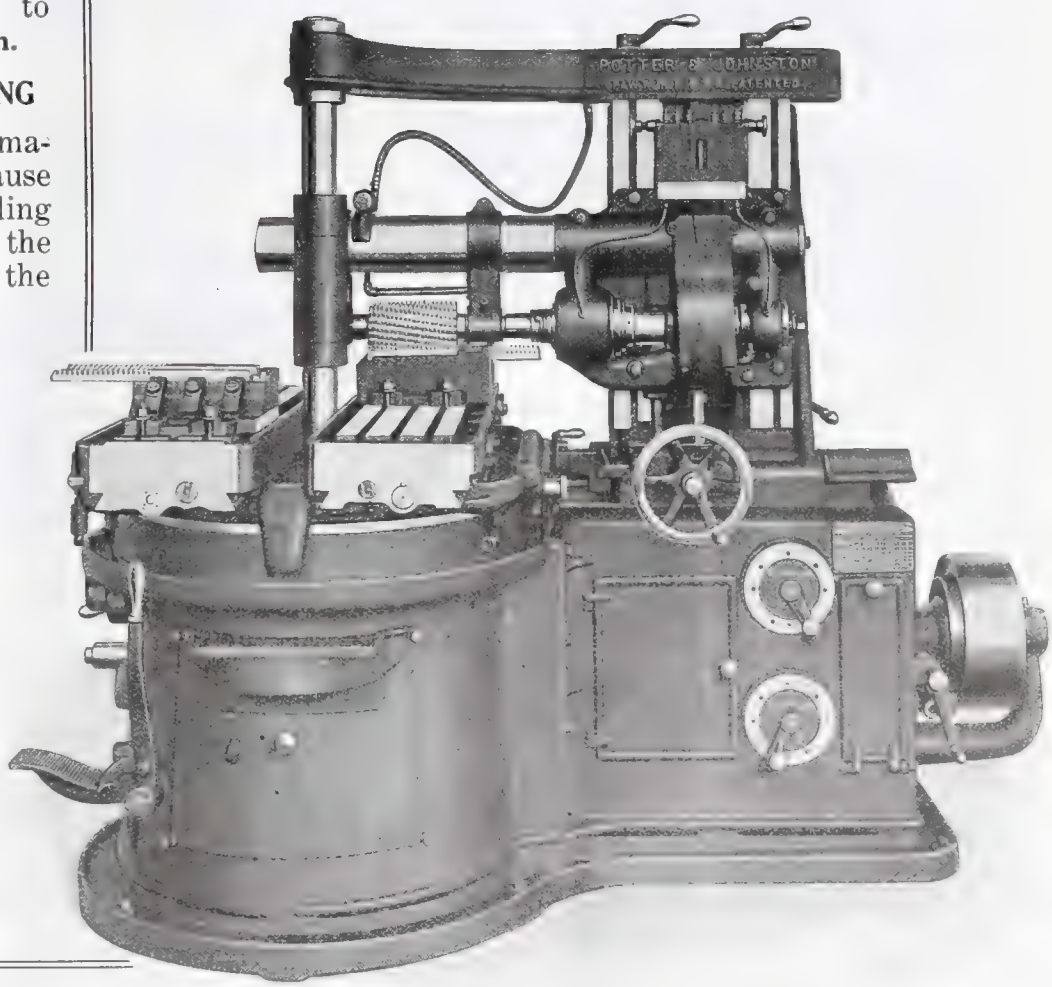
No lost time due to machine idleness because the operator is loading one fixture while the cutter operates on the other.

16 Table Feeds, 7/8 in. to 12 5-16 in.

Length of Table Feed, 28 inches. 12 Spindle Feeds, 20 to 180 R.P.M.

Send us your Blueprints and we'll gladly give you production figures.

Bulletin 36 on application.



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ROELOFSON MACHINE & TOOL CO., LTD.

Head Office: 1501 Royal Bank Building, Toronto, Canada
Works and Warehouse: Galt, Ont., Canada

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No. 43A

Wheel Grains and Grades

The Norton wheels found to be most satisfactory in actual practice for grinding lathe and planer tools of high speed steel are the medium grades M, N, O and P in Alundum, the grain ranging from as coarse as 20 in the larger wheels to as fine as 80 in the small ones. When they are to be used for off-hand grinding on bench and floor stands at approximately 4,500 surface feet, the Norton standard recommendations are:

Wheels 4 to 6 in. diam., 80M, Alundum vitrified.

Wheels 6 to 10 in. diam., 46 to 60M and N, Alundum vitrified.

Wheels 10 to 14 in. diam., 46N or 36O, Alundum vitrified.

Wheels 14 to 24 in. diam., 30 and 36O, Alundum vitrified; also 24 and 30P Alundum vitrified and silicate.

Wheels over 24 in. diam., 24P, Alundum silicate.

The following are the wheels usually furnished for some of the principal machines in use:

Automatic Grinding

Gisholt, 20M and N, Alundum vitrified; 24M to P, Alundum silicate.

Sellers No. 1, 20 and 24L and M, Alundum vitrified; 20 and 24L and M, Alundum silicate.

Sellers No. 2, 36L, Alundum vitrified; 30 and 36M, Alundum silicate.

Taylor 24O, Alundum silicate.

Hand Grinding

Blount, 30O, Alundum vitrified.

Diamond, 24 to 30O and P, Alundum silicate; 36O Alundum vitrified.

Leland and Falconer, 36O, Alundum vitrified; 46N, Alundum vitrified.

Whitney, 30O, Alundum vitrified; 24P, Alundum silicate.

NORTON COMPANY

Canadian Agents: The Canadian Fairbanks-Morse Co., Ltd., Montreal, Toronto, Ottawa, St. John, N.B. Winnipeg, Calgary, Saskatoon, Vancouver, Victoria. E. H. Andrews & Son, Quebec, Que.

Grinding Wheel Plants, Worcester, Mass.

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FOR TRUEING GRINDING WHEELS

QUALITY SERVICE SATISFACTION

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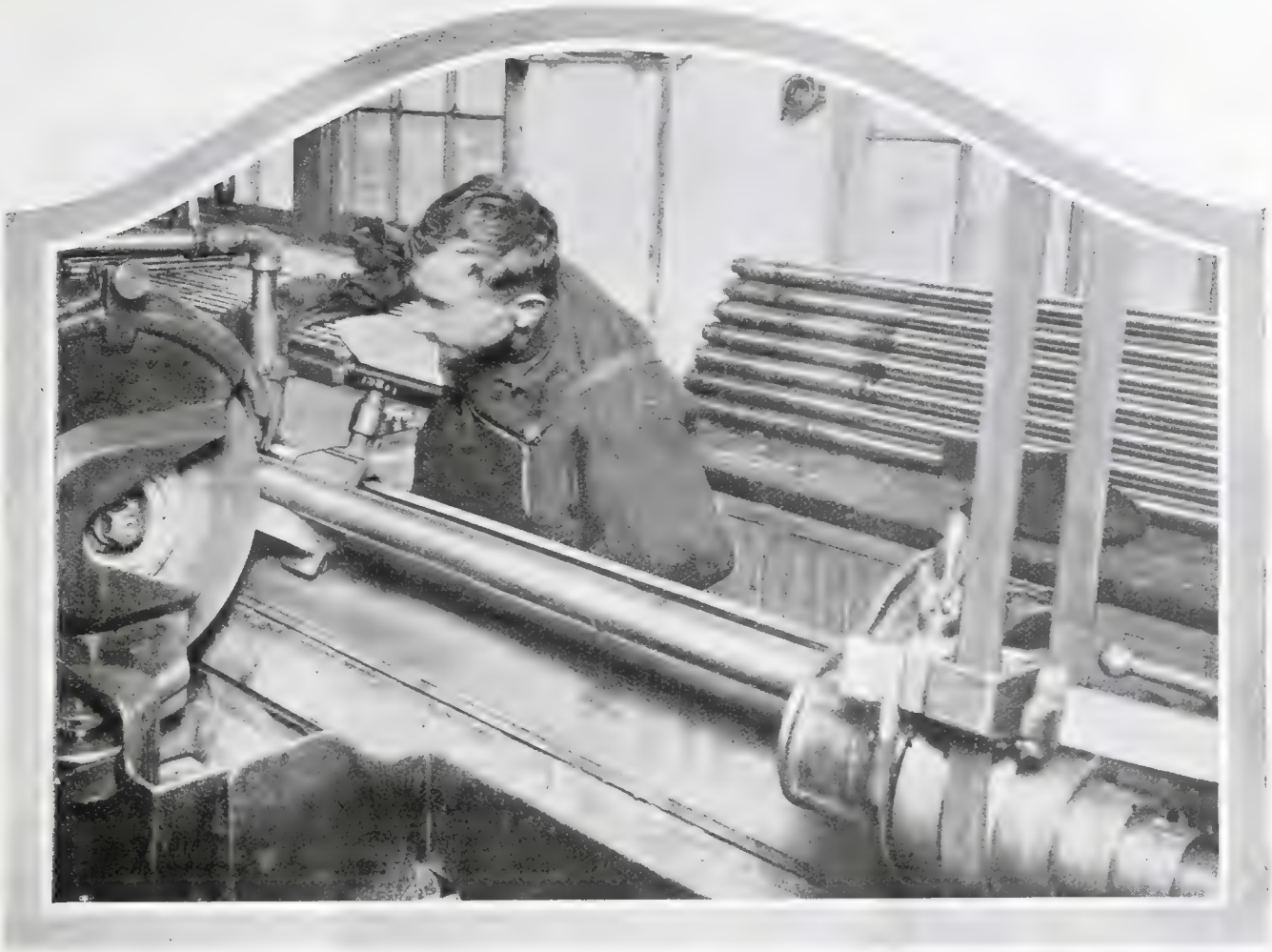
Sole Canadian Agents for

THE JOYCE-KOEBEL COMPANY, INC.

Formerly Geo. A. Joyce Co. Ltd.

NEW YORK LONDON



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Norton Grinding Co., Worcester, Mass.

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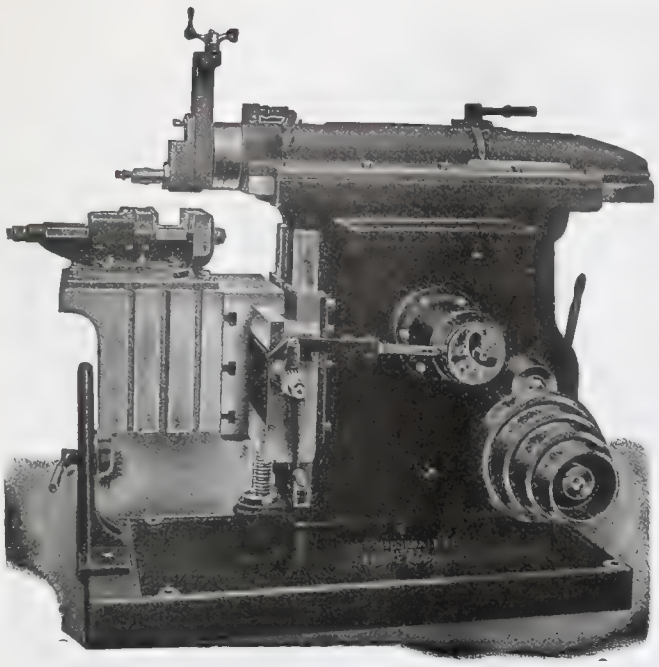

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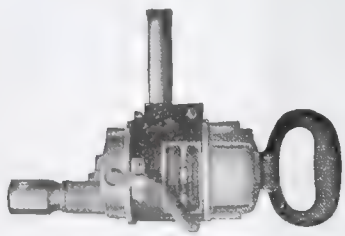

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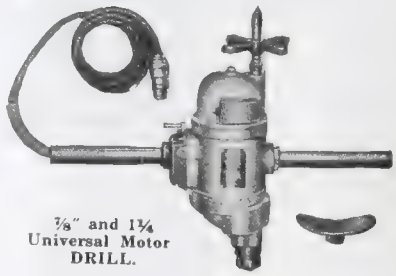

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CANADIAN MACHINERY
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MANUFACTURING NEWS

Volume XXI. No. 22. May 29, 1919

Manufacturing Brantford Roofing Products

An Article Describing the Plant of the Brantford Roofing Co., Together With the Manufacturing Process, From Start to Finish, of This Already Well-Known Line of Roofing Material.

By J. H. MOORE, Associate Editor Canadian Machinery

IN entering upon an article of this nature, about the best plan to follow out is the adoption of the principle of starting from the very beginning, and working up gradually until the actual sale of the material has been completed.

For this reason we will commence by going into, in a very brief way, the plant of the Brantford Roofing Co., whose product we are about to study through its various stages of manufacture.

The complete plant, buildings and yard, covers an area of about seven acres. The construction is modern throughout, with every facility to prevent fire being installed. A patrol fire system and the regular sprinkler system forms a part of this fire prevention scheme.

The plant, of course, is laid off into various departments, which will be taken up in due course later in this article, as we step through each stage of manufacture. It might be well to mention at this point, however, various notable features employed, namely, that this firm conducts its own forge shop, tool room, and steam fitting department, handling all its needed repairs of this nature without outside help. When we state that there is some 35,000 to 40,000 feet of steam pipe ranging in size from ¾ in. to 6 in., one can easily see that there is a great need of such departments. They also develop their own electricity for lighting purposes, and have a 50 h.p. Goldie & McCullough Wheelox engine, together with a 100 h.p. boiler as their power equipment. They have also in operation an up-to-date condensation system, all steam returning direct to the boiler.

To give the readers a sort of glimpse of the financial side of this matter, we are in possession of information that this Company has just been granted a new Dominion Charter, with an authorized capital of $250,000.00. Another notable point in this matter is the fact that practically all the capital invested is Brantford money.

FIG. 1 A GENERAL VIEW OF THE LOADING TRUCK.

In connection with the plant, there is an up-to-date office, where all business matters are rapidly attended to.

Actual Manufacture

But as this article is primarily intended as a study of the manufacture of the products turned out by this firm, we will get on to the subject of asphalt as used in their various lines. This asphalt is refined from Mexican, Texas or California asphaltic crudes. The Mexican crude is either refined in Mexico or comes by tank steamer to New York, or Montreal, where it is refined and then shipped in barrels by rail to Brantford. Texas and California crudes are refined in these states, and shipped in barrels by rail to Brantford. They also use in their coating a Gilsonite, which is the purest grade of natural asphalt and is mined in Utah.

The asphalt, which comes in barrel form is simply stored in their yard until required. When needed, the barrels are rolled onto a wagon specially constructed for the purpose, as illustrated at Fig. 1. This wagon, by the way, has a history all its own. Previous to the use of this method, the scheme employed was as follows: An ordinary lorry was used, and three men had to strain all day lifting up and down the heavy barrels, until the idea of this wagon was suggested. Immediately the staff got busy and built this wagon themselves (in fact, it's a habit they have there of building what they want), with the result that now only the one man actually loads the barrels, the other directing the horse. Time has also been cut to about one-third of what it was formerly, so the change was worth while. The wagon itself was made from miscellaneous material around the shop, so the cost was practically nothing to speak of. The trailer A hooks on the back, and is

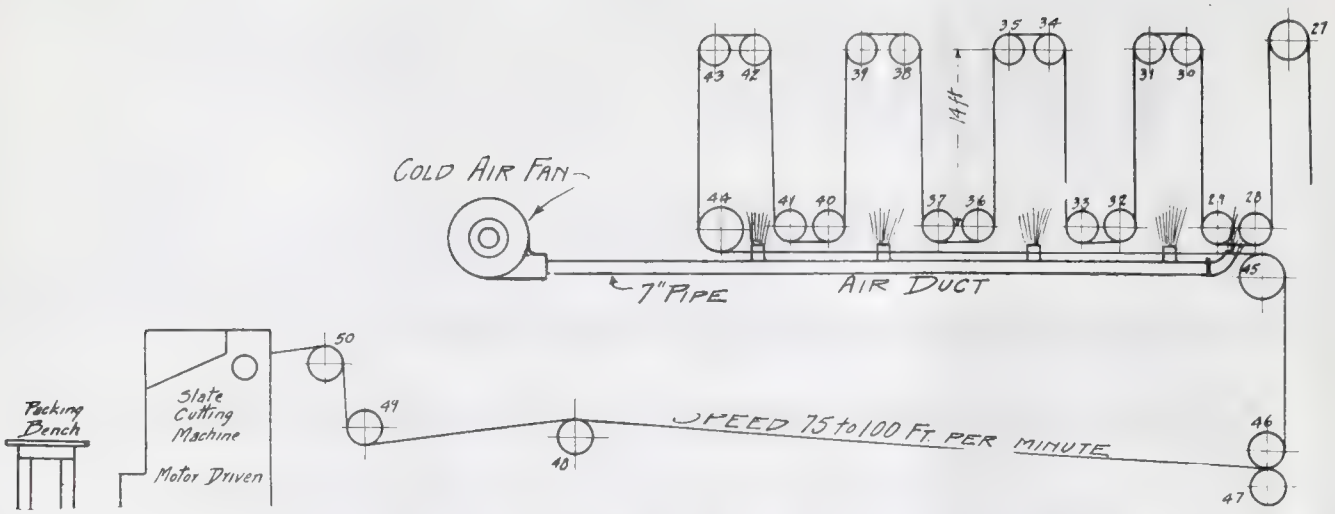


FIG. 2—THIS MACHINE SPREADS OVER A DISTANCE OF 150 FEET FROM END TO END.

simply dragged along, never requiring to be lifted off and on.

The Next Stage

The barrels are now brought by this wagon to the scale house where the gross weight is obtained, after which the barrel goes up on an elevator, or conveyor, to the working floor of the tanks. Here the barrel staves are ripped off and sent down to the scale to be reweighed. This amount is then deducted from the gross weight, which, of course, gives the actual net weight of the asphalt. When it is quoted that last year these reweighed staves weighed over 300 tons for the year, one can form some idea of the wonderful amount of the asphalt used in this plant.

The asphalt on the working floor of the tanks is now broken up by an axe, and thrown into the tanks, together with the other materials, which goes to make up the proper mixture. It is now heated in boilers to a temperature of 400 to 450 degrees Fahrenheit.

There are at present five boilers in operation, two round in shape, and five rectangular. The former are 6 ft. in diameter, 18 ft. long, and have each a capacity of 50 barrels. The latter are 12 ft. x 4 ft. x 4 ft., each with a capacity of 16 barrels. The saturation compound goes to the round tanks, the coating compound to the rectangular, but these technical terms will be explained a little further on in the article. Separate valves control all these tanks allowing either one to be shut off, or vice versa, as desired. After the contents of one of these tanks has reached the desired heat, the fire underneath can be safely drawn, for the temperature of the mixture, after once being heated to the proper point, will not vary even two or three degrees in a space of 48 hours. Of course, the material is always used well inside this time.

Preparing the Felt

Before going on with the saturation or coating used, let us see what happens to the felt on its arrival at the plant.

Before being used for roofing purposes, it is placed in dry kilns, to remove all moisture, both cellular and atmospheric. This is in order that all saturation and coating possible can be soaked into the felt in its process of manufacture. Thirty-two kilns are used for this purpose.

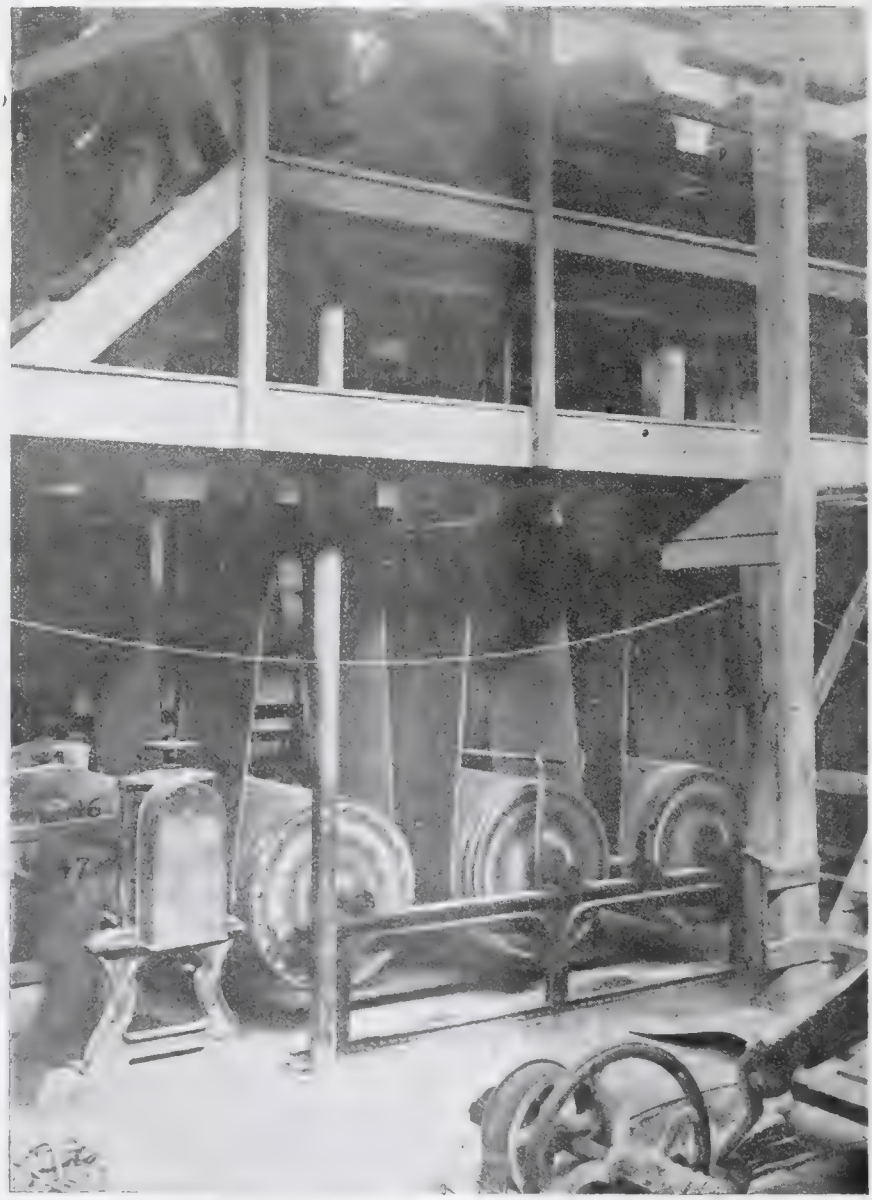
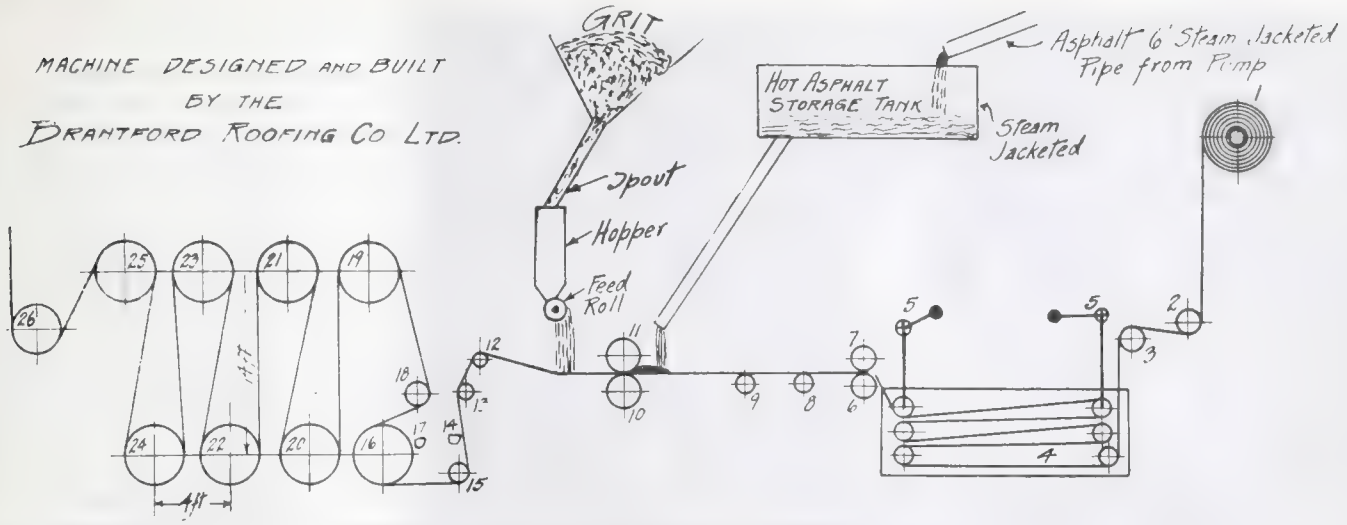


FIG. 3 VIEW SHOWING THE WATER COOLED ROLLERS.

Manufacturing Asphalt Shingle

This dried felt (which is made up in



AND REQUIRES OVER 600 FEET OF FELT TO THREAD THE MACHINE. THE MATERIAL TRAVELS AT ABOUT 75 TO 100 LINEAL FEET PER MINUTE.

rolls of from 50 to 60 squares, and weighing approximately 700 lbs.) is now placed in its starting position on roller 1 (see sketch No. 2). From here it goes down and around the idlers 2 and 3, dropping from there into the saturation pan 4. In this pan are a series of rollers, which allow the felt to travel to and fro in the saturation compound before leaving. This pan has a capacity of 20 barrels of saturation. About 100 feet of felt is running through this pan at all times, allowing ample time for saturation purposes. A handle 5, (with a gear attached), which, in turn, engages with a rack, allows a means of raising or lowering these rolls as desired.

After passing through this pan, the felt goes between the two squeeze rolls, 6 and 7, where all excess compound is removed. The felt now proceeds on its journey over the idlers, 8 and 9, where, after leaving these rolls, it meets in with a stream of coating compound coming down from an overhead supply tank, with spout of correct style for coating purposes. The felt now passes on its way between the steam rollers 10 and 11. These rollers do not move, simply allowing the felt to pass between them.

Immediately after leaving these rolls, a constant stream of crushed slate grit pours down on the felt, bedding itself into the coating, forming a weatherproof covering. From here the felt continues on over the steam pipes (12 and 13), and, of course, by this time the felt is fairly dry. Any excess grit now drops off into the trough (14), where it is returned to its original overhead hopper by means of a spiral conveyor, altogether with an endless bucket elevator.

The felt now passes over the idler roll (15) and over the larger water-cooled roller (16). The trough (17) at this point catches any excess grit that did not fall into the first trough. The work now proceeds over the idler (18), then through the series of water-cooled rolls (19, 20, 21, 22, 23, 24 and 25). The photograph at Fig. 3 illustrates clearly this part of the process. It will be noticed that up at the extreme top of this picture are seen various other rolls. These particular rolls and their function are later explained.

On the drawing at Fig. 2 we have shown a few approximate dimensions to illustrate the general proportions of the apparatus.

After leaving these water-cooled rollers on which the roofing naturally has reduced its temperature, the felt now passes over a series of idlers (26) to (45) inclusive. It will be noticed that the felt at this point has moved up another 14 ft. in height from the first series of rollers.

5. On these idlers the roofing is dried through contact with air supplied by electric fans.

These slots are cut in the following manner: A large roller, which constantly revolves, has inserted in it two knives, as shown at sketch to the right of the shingle at Fig. 4. These two knives, looking from the two directions appear as shown on the sketch. Every revolution means two series of slots being cut. A trimming knife also cuts the shingles to 12 in. deep, as shown. To prevent any tendency of the knife edges to stick to the roofing, a small piece of felt saturated with water comes in contact with the knife each revolution. There are also kickers, which work in harmony with these knives, and kick out the portions cut away.

Fig. 5 illustrates clearly the work coming from this cutting machine; also

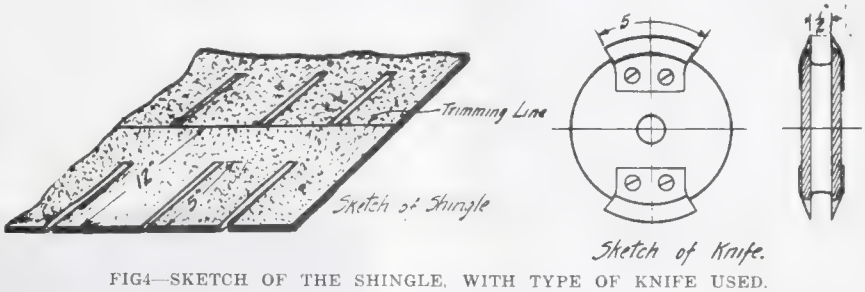


FIG4—SKETCH OF THE SHINGLE, WITH TYPE OF KNIFE USED.

Readers will also notice that after leaving the idler roll (44) the roofing comes back in a horizontal distance to the idler (45). From there it passes down through the pull rolls (46 and 47), (see photo at Fig. 3), where the roofing is pulled over the idler (48) into the flanged guide rolls (49 and 50).

From here it goes direct into the cutting machine, where it is cut into shape as desired.

The material being manufactured while the writer was taking the accompanying photographs was what is known as slab shingles, and an idea of its style might not be amiss. The sketch at Fig. 4 illustrates a portion of this shingle, which is 32 in. in width over all. It will be noticed that the slits, or slots, as cut in this material are about ½ in. width and 5 in. long.

illustrating the method of packing ready for shipment. After completion the material is stored in a concrete floored warehouse, heated by exhaust steam, until shipment is desired. This material, together with many others of their lines, can be finished in two colors, namely, red or green grit, or crushed slate, as it is sometimes called.

To go into all the various materials this firm turns out would take a volume, but following is a brief list of some of their products:

Sanded roofing, smooth finish roofing, Mohawk roofing (which is sanded on one side only), slate, red and green; crystal, red and green; and Climax building paper. As can be understood by readers, all these various materials serve their own particular function, each

FIG. 5 A VIEW OF THE CUTTING MACHINE AND PACKING BENCHES.

being especially adaptable to various conditions and requirements.

To avoid confusion, it might be best to add at this point the method employed of pumping the asphalt used throughout the processes just described. The only reason for not mentioning this matter earlier was in the writer's endeavor to allow the roofing to pass through its various stages of manufacture without interruption.

As readers can understand, if an ordinary type of pump was used the asphalt would soon lose its heat and congeal, (or to use the general expression freeze up) and block the supply pipes. For this reason Kinney steam jacketed pumps are employed for pumping purposes, in this way keeping the asphalt up to proper temperature. It can be easily understood that all supply tanks have to be emptied each evening, otherwise the result would be a solid mass of asphalt in the morning.

As readers no doubt already know the roofing is held in position on the roof by means of large-headed roofing nails, the laps being cemented with lap cement, both of which are packed in containers in the centre of the rolls. With the asphalt shingles, no cement is used, but they are nailed according to the directions supplied by the Company. The lap cement is manufactured by the Company in their paint department.

Paint and Lap Cement Process

The rosin and oils used are first placed in a storage shed until required. They are now run up to a large varnish kettle, and melted in correct proportion. From here it is pumped into storage tanks in the paint department, each tank being controlled by separate valve There are 14 tanks in this department. The size of this paint dept. alone is 24 x 100 ft. The lap cement is now placed into small cans and the tops capped on a special capping machine for the purpose, no solder being used. A 5 h.p. electric motor and a Gould rotary pump form a part of this department's equipment. The other styles of paint are made up in the usual standard sizes of cans.

It might be well to add before going any further, that all material turned out by this firm undergoes a severe test before even being placed on the market. For illustrative purposes we will suppose they contemplated placing on the market some particular brand of roofing.

The first step would be to make some of the proposed material and mount it in the regular way on a test roof. There it is left through all sorts of weather conditions, until they are perfectly satisfied in their own minds that the workmanship, material, and ingredients are all satisfactory.

Preparation and Shipment

We will now go on to the actual preparation of the various materials for shipment, taking into consideration the rolled roofing first. This material is carefully put up in roll form and in the centre of each roll is placed about 2 lbs. of roofing nails in a package, together with a tin of lap cement. A metal protection cap is now placed tightly on each end of the roll and the material is now ready for shipping purposes. The actual amount in each roll varies according to the material being handled. When slate or shingle material is being packed. it is placed in bundles with wooden tops and bottoms, as shown at Fig. 5, being protected by paper as well and securely tied with strong cord.

The material is now taken from the warehouse to the car on the siding, which runs directly up to a large shipping door for this purpose. Fig. 6 illustrates clearly the actual packing of the car, and hardly needs any comment, as the photograph is self-explanatory.

Other Features of Interest

Before closing this article it will be interesting to follow other features of interest which go to show that the energy is not alone confined to the inside of the plant.

First, and very important, all the material as used throughout this plant undergoes laboratory inspection. Samples are sent regularly to the Milton Hersey Co. of Montreal, who test the various materials carefully, sending in their reports. The writer personally looked over these, and could not help but notice the splendid reports given, showing that care is exercised in the choosing of these materials.

The sales force of this firm is another notable feature of the Company; they sell their products in all parts of Canada. Branch offices and warehouses

FIG. 6 LOADING THE MATERIAL ON THE CARS.

are maintained in Winnipeg, Toronto, Montreal, St. John, Amherst, and Halifax. The company, in all, have ten salesmen selling their products. The salesmen usually travel by motor car, as in this way they can cover more territory and keep in better touch with their customers.

Another feature in their selling campaign is the sending out of samples and booklets of their various lines to those interested. They also advertise extensively.

In conclusion the policy of the Company from first to last is Quality and Service, with the idea of producing only roofing materials, etc., which have stood the test and proven to be goods that they can be justly proud of.

Japanning and Enamelling Cot and Bed Frames

An Article Discussing the Various Heat Methods Employed, Holding Up in Particular the Electrically Generated Heat System as That producing the Best and Most Uniform Results

By B.S.B.

THERE are so many manufacturing processes which require ovens or furnaces heated to different degrees of temperature for one or more operations that the field for electrically generated heat is becoming larger every day.

"Ovens heated by steam, oil or gas have been in use for some time and have been fairly successful," says A. M. Clark, Industrial Heating Department, General Electric Company, "but no one will contradict the statement that electrically generated heat, in most cases, produces better and more uniform results. Wherever applicable, it is usually cheaper in the long run, due to the avoidance of losses which are present in gas, steam or oil-heated ovens."

"Skilled workmen are being concentrated more and more on our most vital industries, but other industries must continue to manufacture with best help obtainable. Unskilled labor can be employed where electrically heated ovens are used without lowering the standard quality of the product. This is, in a great measure, made possible by the fact that the temperatures in an electrically heated oven may be automatically controlled within very close limits.

"The New York Couch Bed Company, of Long Island City, N.Y., manufacture all kinds of couches, beds and hammocks, both collapsible and otherwise.

A japan baking and enamelling oven, equipped with General Electric heaters and automatic temperature control, bakes the finish on the metal frames, brace rods, and legs of beds, couches, etc. This oven is 21 ft. long, 8 ft. wide, 9 ft. high, and is insulated throughout with a double course of heat insulating material, protected by a facing of common building brick. The inside walls and ceiling are lined with sheet metal.

Fig. 1 shows the outside of this oven with the automatic control and part of the ventilating system. The heaters installed total 45 kw. and are distributed under the floor throughout the length of the oven, being connected in series parallel. Two controlling Tycos thermostats, one for each end of the oven through relay coils to the contractors, control the temperature, thereby affording a very even distribution of heat in all parts of the oven. There is also a motor and blower, forming a part of the ventilating system for carrying off the vapors which are given off by the japan during baking. Two-thirds of the ventilation is from the bottom of the oven, the other third being from the top. Ventilation is provided for in this way, because most of the vapors from japan and enamel are heavier than air and sink to the bottom of the oven. The parts to be treated are baked for 3 hours at a temperature of 170° F.

As shown in Fig. 2, the work is either run in by means of an overhead conveyor system, or put on racks on trucks which are placed in the oven in the manner shown.

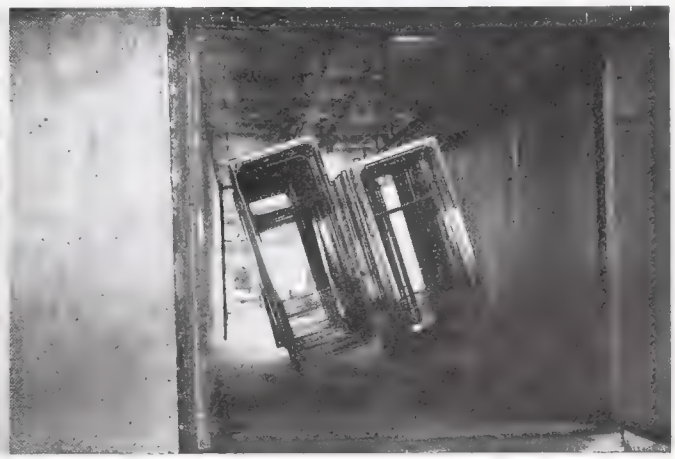
MOLTEN METAL

The death-dealing energy stored up in molten metal is immense, and it is an extraordinary fact that it is possible to meet foundrymen who still do not appreciate or understand the dangers they are facing when acting thoughtlessly when dealing with such metal. No man—for the sake of others as well as himself—should be allowed to run risks in this way. In the foundry the taking of chances should be rigorously suppressed.

A furnaceman who heedlessly pitches lumps of cold metal into a melt already well under way disregards the fact that the destructive energy contained in the molten metal is probably sufficient to wreck the place in which he is working—as to what would happen to him in the event of such an accident occurring we must leave to conjecture.

It is the duty of the executive to see that the furnaceman does not act carelessly in such a way as that mentioned; also they should see that he is not troubled by anyone when he is dealing with molten metal; his whole attention should be devoted to the job on hand.

TUNNEL TYPE JAPANNING OVEN AT NEW YORK COUCH BED CO., LONG ISLAND, N.Y.



INTERIOR VIEW OF TUNNEL TYPE JAPANNING OVEN.

The Use of Jigs, Tools and Special Machines

Being an Article on Jigs, Tools and Special Machines, With Their Relation to the Production of Standardized Parts. A Study of This Article Will Prove Well Worth While

By H. C. ARMITAGE*

(Continued from May 22nd issue)

The connecting rod and cap which are manufactured throughout together, are illustrated in Fig. 4, and produced from one stamping, so that the connecting rod and cap are made together when forging. The manufacturing operations in the smallest basis of production are as in the lay-out under Fig. 4, Table III, page 406.

Jig for Milling Large End of Connecting Rod (Fig. 5)

There are two connecting rods placed in the jig at once, and a gang of four straddle mills are advanced across the work. The components are held at the bottom in fixed V-blocks, AA; and both are gripped together by a clamp B, which is given a wide range of movement by a cam C, pivoted on fixed stud D. The clamping action is transmitted to the work by two sliding V-blocks, and at the top of each is a small steel ball, to take the thrust. As it is most important that there should be no distortion of the connecting rods in this operation, the other end is held vertically by means of a fixed V-block, which is as near a knife-edge in section as practicable, and a set-screw pushes the small boss against a rounded stud, thereby preserving the alignment of the connecting rod sufficient for the next operation. Theoretically the rod should have been "equalized" at this end, but, if there is a moderate machining allowance for facing, it becomes an unnecessary refinement.

This operation is likely to give trouble if the cutters are not of a reasonable stiffness, and should there happen to be more metal to remove from one face of the connecting rod than the other, the cutter is likely to spring, owing to its large diameter. To get the best results there should be a close spacing of the cutter teeth—the opposite of the modern practice of giving cutters the fewest possible teeth. The reason is that the metal to be operated on is likely to prove hard. If there is a fairly large feed (say, 1 in. per minute) and wide spacing, there is a substantial knock, due to the large shoulder of metal which will have fed up while the cutter tooth space has been passing. This knock is transmitted throughout the milling machine, and causes the cutter teeth rapidly to become dull, as well as producing a poor finish on the work. The setting gauge G is made of hardened steel, and is about 30 thousandths less in width than the finished work. In setting up, a feeler is used 15 thousandths in. thick, and the cutters thereby spaced equally on each side of the game.

Milling the Small End of Connecting Rod (Fig. 6).

In all milling jigs it is one of the chief aims of the designer to make the height as small as possible to prevent vibration and obtain stiffness. The rods are clamped at the large end against one of the machined faces and as longitudinal accuracy is not yet required, pegs are a sufficient support. The part where the cut has to be supported is clamped to a flat or slightly dished plate, and tightening one bolt is sufficient to hold two rods without distortion. Note that the direction of the pressure from the cut must be downwards on to the solid plate, and not against the clamps.

Rough Drill Both Ends of Connecting Rod (Fig. 7)

This jig is of "box" form, and as the walls of metal around the small hole are not to be machined outside, and also are comparatively small, the location is taken from a screwed bush, which seats conically upon the small end, thereby obtaining concentricity. The bosses of the connecting rod rest upon hardened bushes, the holes of which are larger than the drill-guide bushes, to clear the drills when breaking through the work. The bush under the large end has three relieved feet to keep the face clear of the chippings. The bushings are formed to make cups for the lubricant, and the whole base of the jig forms itself naturally into channels for carrying away the cutting solution. The bushes of the screw-down type are far from being ideal construction, as it is practically impossible to say that a threaded bush is perfectly square or without play. Bushes with a spiral recess are now largely used instead.

Broaching the Small Hole

The small hole having been drilled about 12 to 15 thousandths smaller than the finished size, it is possible to broach out this amount in one "pull through," on a modern broaching machine. At the present date, however, the reamer still seems to have preference over the broach in the majority of work for this purpose, although in the author's opinion the former should only be used by hand when the parts are being assembled, and then with a strong jig to guide the tool, and keep it square. On an operation of this description a reamer would be under size after doing about six connecting rods, whereas a broach can do from two to three hundred at the very least without being touched.

The reason why the broach is not universally used is chiefly due to the manufacturing difficulty. There is considerable amount of work in cutting and sizing every separate tooth, and, being long in proportion to its diameter, it invariably bends when being hardened. The usual practice is to use a case-hardening steel which can be "peaned" straight afterwards. This is one example of the general problems before the tool-making and manufacturing world to-day, and on which a few remarks will be offered later in the paper.

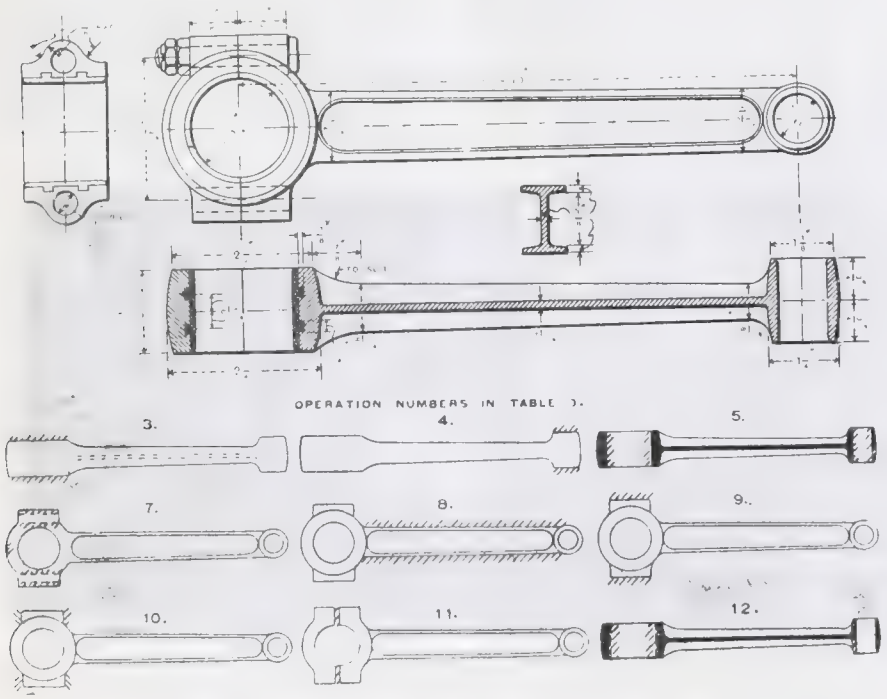


FIG. 4 VIEW OF THE ROD AND ITS OPERATIONS.

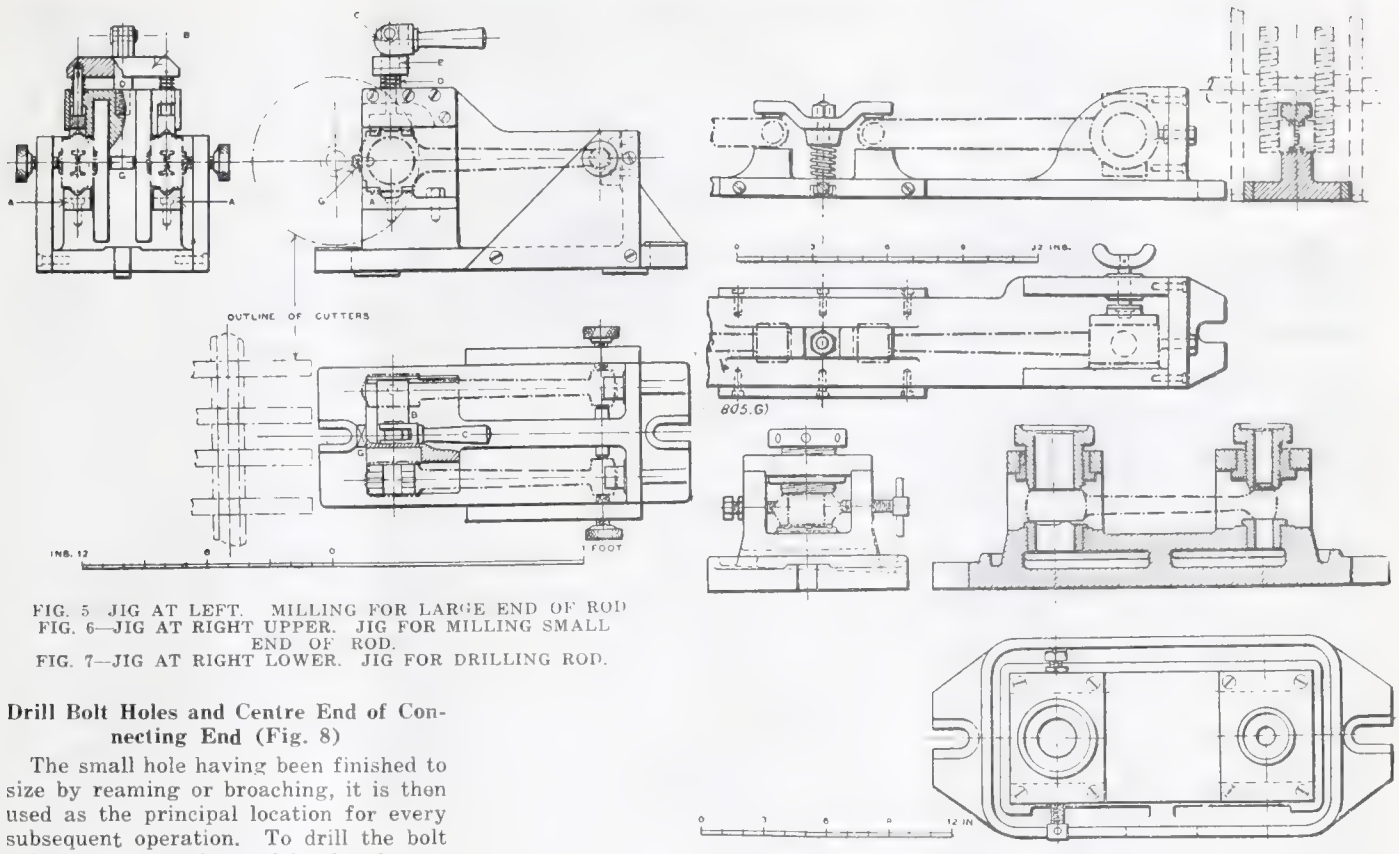


FIG. 5 JIG AT LEFT. MILLING FOR LARGE END OF ROD
FIG. 6—JIG AT RIGHT UPPER. JIG FOR MILLING SMALL END OF ROD.
FIG. 7—JIG AT RIGHT LOWER. JIG FOR DRILLING ROD.

Drill Bolt Holes and Centre End of Connecting End (Fig. 8)

The small hole having been finished to size by reaming or broaching, it is then used as the principal location for every subsequent operation. To drill the bolt holes, the connecting rod is placed upon two pegs which are fixed to a vertical plate. The jig illustrated is for use on a box-bed drilling machine, care being previously taken that the side of the bed is perfectly square. Attention must be drawn to the centre which is put into the top of the connecting rod during this operation. If this centre were not put in as a locating point for finishing operations, there would be no accurate location for the boring, since bolts have to be put in to secure the cap and thereby destroy the side holes as the natural spotting points.

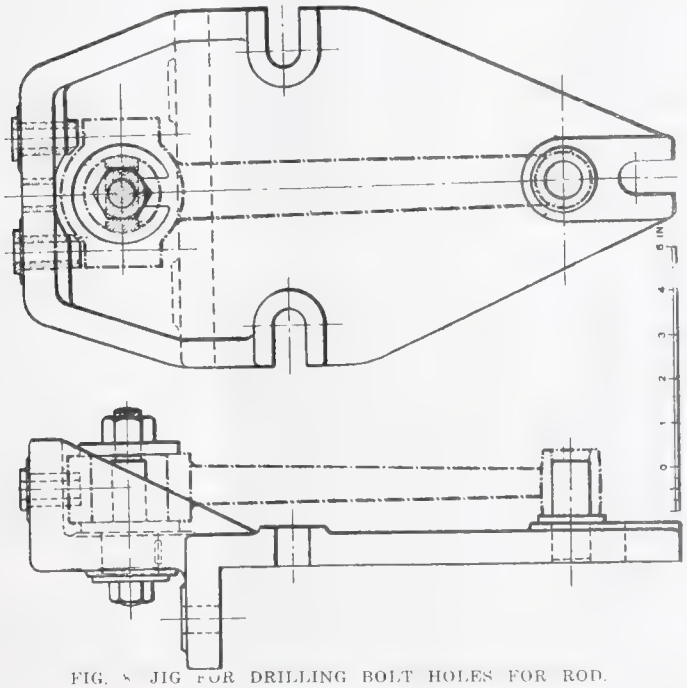


FIG. 8 JIG FOR DRILLING BOLT HOLES FOR ROD.

Mill Sides of Rod

This is a duplex jig, and similar to Fig. 9, and calls for little special comment, except that the peg which supports the large end has been cut away at the sides. As will be noticed in subsequent illustrations, this allows for slight errors of a few thousandths in the diameters and centres of the holes.

Mill Across Bolt Hole Bosses (Fig. 9)

In this jig it is possible to machine four rods at once. Two form cutters are used, and the importance of getting them in the correct position sideways will be noted. This is obtained by means of the three case-hardened spacing bushes ground accurately to make up the total width required. In setting up the cutters lateral accuracy is obtained by the hardened steel guide working in the recess. The middle bush must have a considerable clearance to avoid the chippings which might rest on the top face of the strip.

Milling Bolt Face

It has not been considered necessary to show a drawing of this jig, as it will be practically the same in construction as Fig. 9, except that side facing cutters are used, and the cutters will operate at right angles to the direction in that case.

Parting Of the Cap

This is done in a jig, and the cap removed by means of a 3-16 in. circular saw. The disk method of positioning the cutter laterally is again used, and location taken from the small hole.

Finish Bore the Large End (Fig. 10)

The cap having been bolted to the connecting rod after the sawing operation, the rod is ready for finish boring. To do this (since the large hole is no longer round) the location is obtained from the centred hole. The boring jig shown is for use in a lathe, and the spigot fits in a recess in the face plate. The equalizing clamp is a construction detail worthy of notice, as it is placed here to make

a support against the pressure of the cutting tools. If no stops are used there is danger of twisting the connecting rod and throwing the finished hole out of alignment with the small hole; and accuracy in this respect is most essential. When the rod is machined in a centre lathe, the work will require turning round and resetting. The rod is then white metalled, and afterwards only requires a finish boring operation on the soft metal. The boring jig is practically identical with the one already illustrated in Fig. 10.

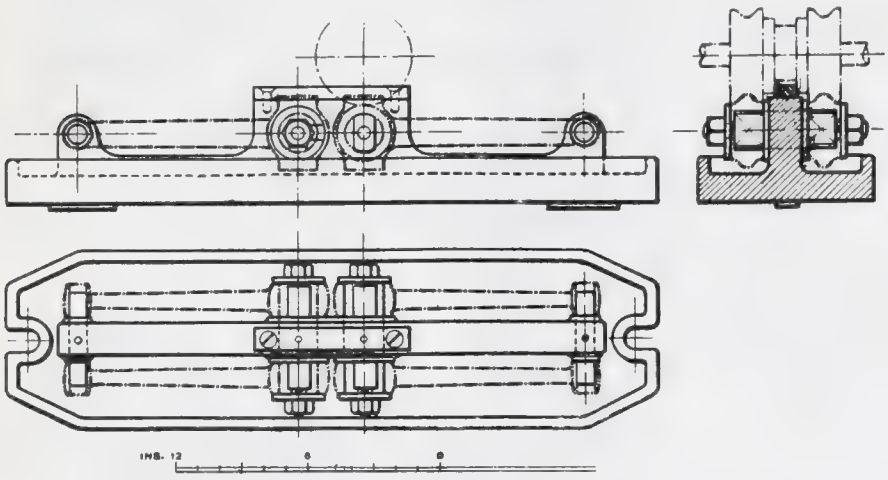
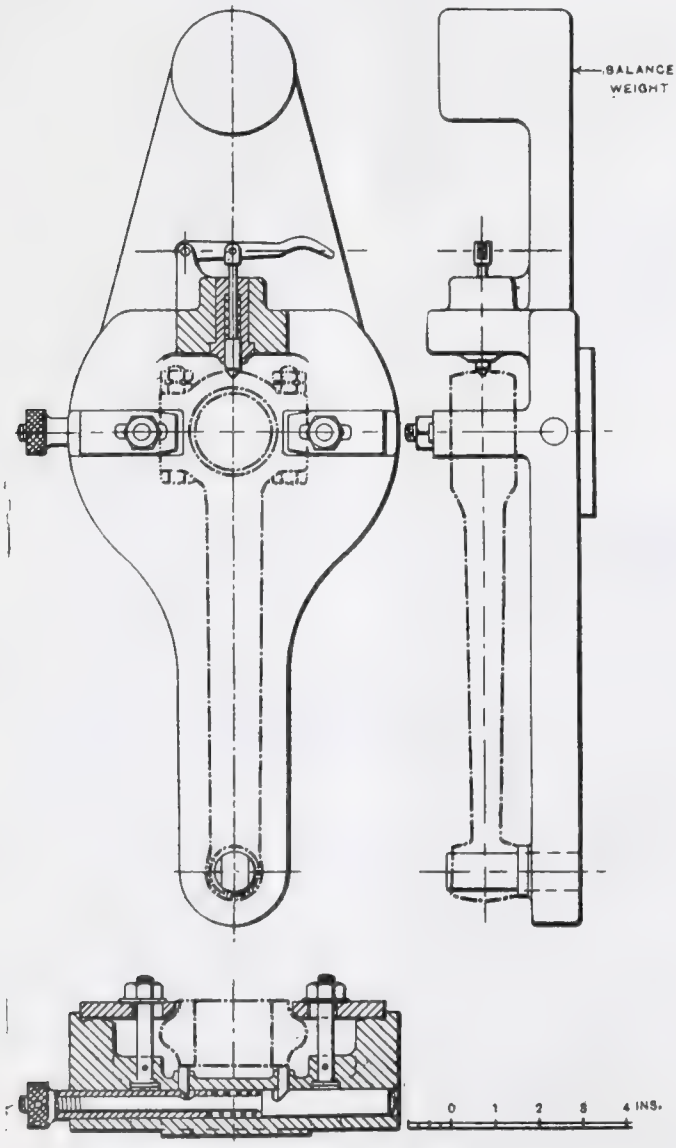


FIG. 9 JIG FOR MILLING SIDES OF ROD ON BOLT HOLE BOSSES.



BORING JIG FOR FINISHING LARGE END OF ROD IN THE LATHE.

To be continued

SIMPLIFIED ELECTRIC WINDING

The latest practice in geared winding plant for mines is represented in an equipment recently installed in a British colliery, with a shaft 720 feet deep. An old beam-type steam engine was replaced by electric plant driven by a 370 horsepower electric motor operating the drum through double helical gearing, giving a reduction in speed of nearly 10 to 1. A remarkable feature of the change was that the steam engine stopped work on a Saturday afternoon and the electric plant started up promptly on the following Monday morning. This rapid transition was accomplished by building the electric winder house just behind the existing house; only a few hours were required to move the wire ropes from the old drum to the new. In winding plant it is necessary to have a very even and rapid speed control at starting and stopping, and this essential is secured in the electric winder by the use of an ingenious liquid controller of the "weir" type. The liquid is continuously pumped from a lower tank to an upper tank fitted with a sluice gate, which is raised and lowered by the driver's operating lever. When the gate is raised the level of the liquid rises and the electrical resistance falls, thus allowing the motor to gain speed. When the gate is lowered the liquid runs away, the resistance rises, and the speed of the motor is gradually reduced. Auxiliary devices are also used to prevent overwinding and over-speeding. The whole equipment is, in fact, an excellent example of a "fool-proof" electric plant.

IRON CEMENT OR FILLER

By T. H.

In workshops where there is filing and drilling there is usually a lot of fine cast iron in powder to be thrown away, the stuff being a nuisance generally, yet when a joint has to be made or a hole in a casting stopped, filings are conspicuous by their absence. Sufficient finely-sifted stuff passing a 32-in. gauze sieve should be secured, thoroughly dried and kept in an air-tight tin or bottle, and when wanted for use, 80 parts of filings, 2 parts sal-ammoniac, and 1 part flower of sulphur should be very intimately mixed, being careful to finely powder the sal-ammoniac. Immediately before use this mixture should be made into a stiff paste with water and pressed into the cavities, ramming with a piece of wood. In two or three days the material will be hard, and can be filed down level if desired, but it has a slightly brown appearance caused by the formation of oxide or rust.

Canadian Machinery Drafting Course—Part V

As Promised in the Previous Portion, We Will Only Touch on the More Important Problems in This Subject of Geometrical Drawing. Following Are the Next Six Problems, Together With Explanatory Data

By J. H. MOORE, Associate Editor Canadian Machinery

IN the previous instalment on this very necessary subject we defined certain definitions, up to the point of the obtuse angle, stopping at the aforementioned angle in order to proceed with plate No. 4.

We will now go further into the subject of geometrical terms and their meanings.

Leaving the angles we next come to the subject of surfaces, which prompts the enquiry, "What is a surface?"

A surface is produced by the motion of any line. It always has two dimensions, namely length and breadth.

There is another type of figure termed the plane figure. This could be explained as follows:

A plane figure is a plane bounded on all sides by lines, the space included within these lines (that is, taking it for granted that they are straight lines) is called a polygon, or as sometimes termed, a rectilinear figure.

So now, since we've come to polygons, let us see what various types we find.

A polygon proper is a plane figure which is bounded on all sides by straight lines, these lines being called sides, and the sum of these sides being termed the perimeter, which of course means all the way around.

These polygons are classed according to the number of sides they have and are as follows:

A triangle is a polygon with three sides; a quadrilateral is a polygon with four sides; a pentagon, with five; a hexagon, with six; a heptagon, with seven; an octagon, with eight; a decagon, with ten; a dodecagon, with twelve; an equilaterial is a polygon whose sides are all equal. A regular polygon is one all of whose angles and sides are equal.

These definitions describe in full the various type of plane figure met with in geometrical problems, in fact some of those mentioned in the list very seldom appear, but for the student's benefit have been spoken of in order that he may familiarize himself with the names.

Now polygons again can be classified into various headings, in fact such is necessary, so briefly we will proceed to find what some of these general headings are.

First we come to triangles, namely the polygon, with three sides. The angles of a triangle are of course the angles formed by these sides. Figs. 1 to 6 illustrate the different type of triangles met with. At Fig. 1 we see the right angled triangle, or as it is commonly termed, the right angle. The longest side of this angle, that is the side opposite the right angle, is called the hypotenuse, the other sides are simply termed sides, or, as some people prefer to say, legs.

Fig. 2, the obtuse angled triangle, is one that has an obtuse angle as shown.

Fig. 3, the acute angled triangle, is one which has all its angles acute.

Fig. 4, the equilateral triangle, is one (as the name denotes) having all its sides equal.

Fig. 5, the isosceles triangle, is one, two of whose sides are equal.

The altitude of a triangle is the perpendicular drawn from the vertex to the base, see lines A on Fig. 5.

Fig. 6 illustrates the scalene triangle. This triangle has no two sides equal.

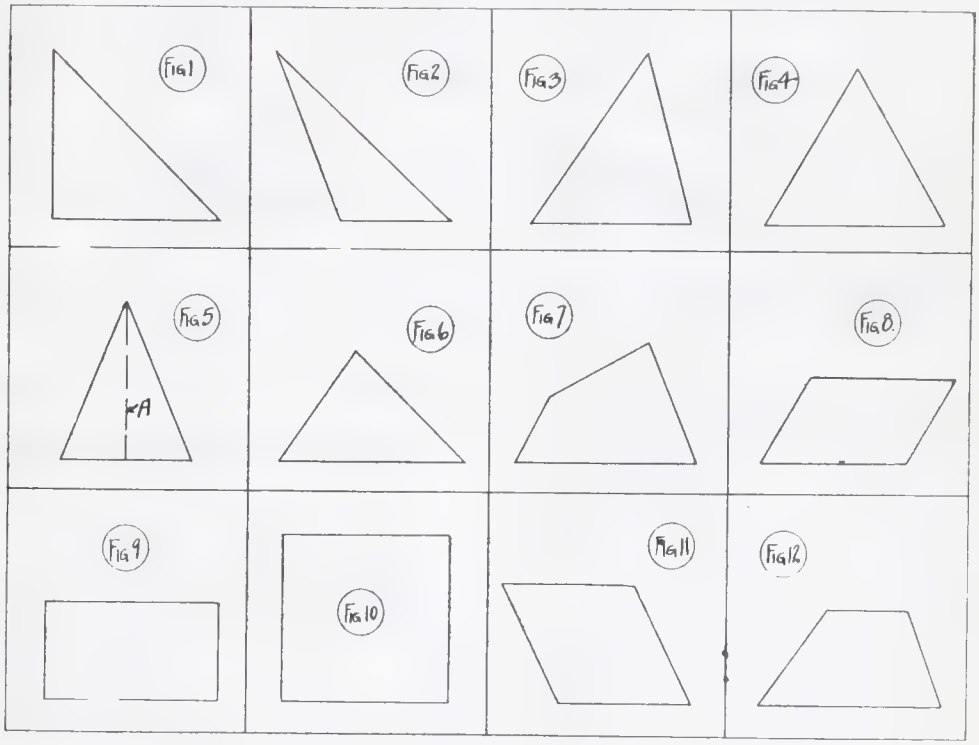
A square is a parallelogram whose sides are all equal, and whose angles are all right angles (see Fig. 10).

A rhombus is a parallelogram whose sides are equal but whose angles are not right angles (see Fig. 11).

A trapezoid is a quadrilateral having only two sides parallel (see Fig. 12).

But enough of definitions in this section, so let us get on to plate No. 5.

As will be noticed, this plate is divided into six problems, each dealing with polygons in one form or another. As before, the dimensions are 9 in. by 13 in. for the border lines, and 9½ in. by 13½ in. for trimming. Divide the 8 in. by 12 in. space into six portions as shown and proceed as follows:



FIGS. 1 TO 12—SHOWING VARIOUS TYPE POLYGONS.

The lowest side of a triangle is always called the base. Any side may of course be taken as the base, but usually the side upon which the triangle is supposed to stand is generally accepted as the base.

Quadrilaterals

Polygons are again subdivided into quadrilaterals, or polygons, with four sides, of such shape and names as follows:

A quadrilateral is, to commence with, a figure bounded by four straight lines (see Fig. 7).

A parallelogram is a quadrilateral whose opposite sides are parallel (see Fig. 8).

A rectangle is a parallelogram whose angles are all right angles (see Fig. 9).

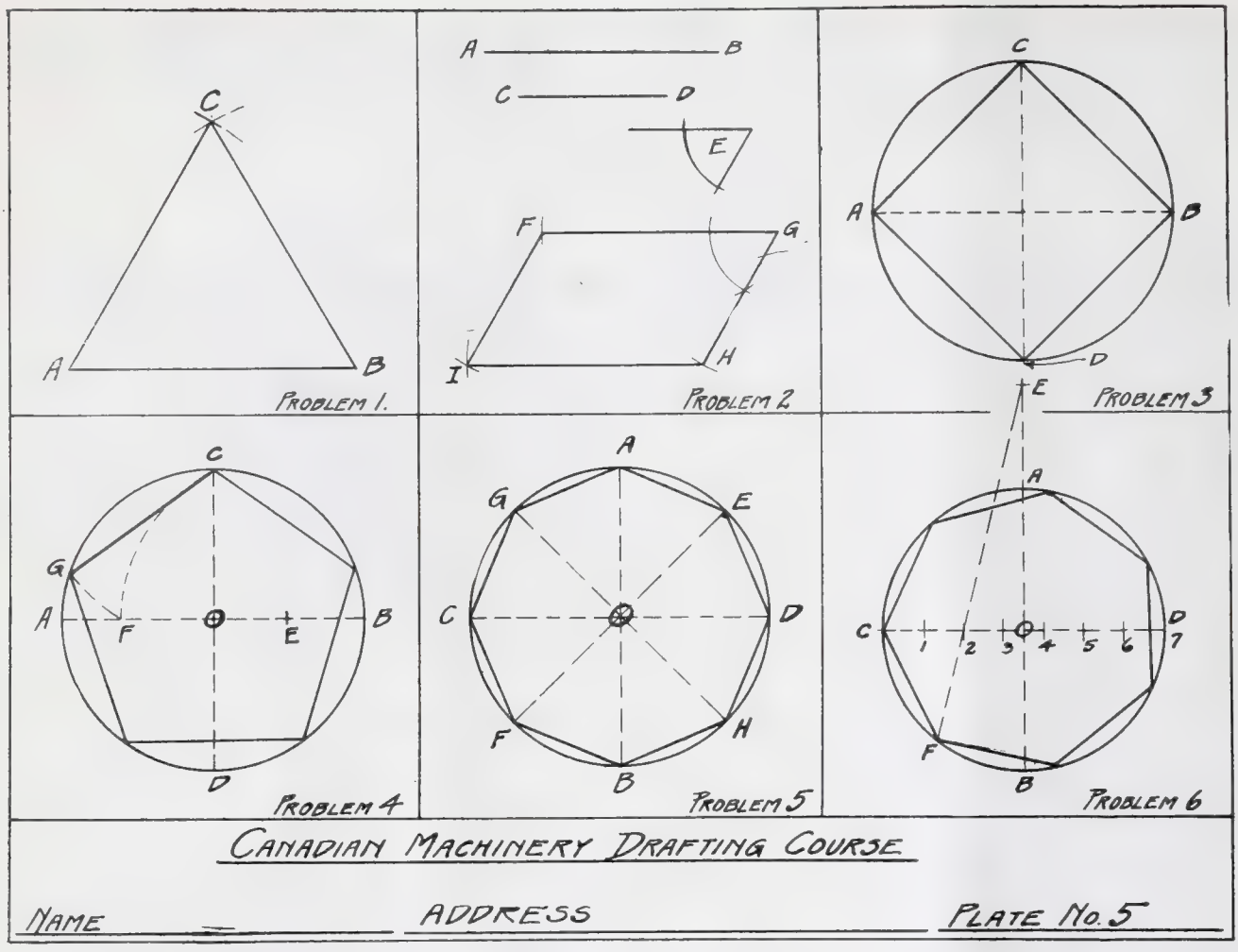
Instructions for Plate 5

Problem 1.—To construct an equilateral triangle, one side being given.

Draw A B 2¾ in. long. With A B as a radius, and A and B as centres, describe two arcs intersecting at C; join CA and CB. The result being an equilateral triangle.

Problem 2.—To construct a parallelogram when the sides and one of the angles are given:

Suppose AB and CD to be the given sides, AB 2¼ in. long, CD 1¾ in. long. Let E be the given angle. Draw FG equal to AB and draw GH, making the angle with FG similar to the angle E.



THIS COURSE DEPENDS ON YOUR REPLIES FOR ITS SUCCESS. ARE YOU SENDING IN YOUR WORK REGULARLY?

Make the line GH equal in length to CD. With H as a centre and a radius equal to AB, describe an arc at I. With F as a centre and a radius equal to CD, describe an arc cutting at I; join FI and IH, when you have constructed your parallelogram.

Problem 3.—To inscribe a square in a circle:

Draw the circle, as shown, 3 in. diameter; draw next the two diameters AB and CD at right angles to each other; join these points of intersection with the circle, and in short order you have a square completed as shown.

Problem 4.—To inscribe a regular pentagon in a given circle:

Draw the circle as shown 3 in. diameter; draw the two diameters AB and CD as before; consider the centre of the circle as the letter O; bisect OB as shown at E (note: your previous plate gave this problem of bisecting a line). With E as a centre and EC as a radius draw the arc CF, cutting AO at F. With C as a centre and CF as a radius, draw the arc FG, cutting the circumference of the circle at G. The chord GC is one side of the pentagon. The rest of the construction is left to the student, for it is self apparent, the one side being obtained.

Problem.—To describe a regular octagon in a given circle:

With O as a centre describe a circle

HERE ARE THE PRIZE WINNERS FOR PLATE NO. 2

R. Learmonth, 49 Wychwood Ave., Toronto, Canada.
J. O'Brien, St. Jerome, Quebec, Canada.
A. C. Bailey, Bracebridge, Ontario, Canada.

Is your name here? If not, make up your mind to work your hardest; send in your work and win a prize.

Tear off and send with drawing

Name .....

Address .....

Position .....

Firm's name.....

3 in. diameter; draw the two diameters AB and CD, bisect angle AD at E, and draw line E to F; bisect the angle AC at G, then draw GOH. Join the points of intersection with the circle and you have your regular octagon constructed.

Problem 6.—To inscribe a regular polygon of any number of sides in a given circle:

With O as a centre draw a circle 2½ in. diameter. Draw the two diameters AB and CD; prolong AB as shown, making AE equal to three-fourths of the radius OA; divide the line CD into as many equal parts as the polygon has sides as shown at 1, 2, 3, 4, 5, 6 and 7. (Of course this can be any number). Now draw a line through points E and 2, cutting the circle at F; draw the chord CF, this is one of the sides of the polygon. Of course the others are easily obtained by spacing off around the circumference.

This completes plate 5. Print in Problem 1, etc., in their proper places, also be sure and print in the title, for it is all good lettering practice. Do not let the fact that summer is here detract you from your work, but keep on sending in your plates.

A Summary of the Mineral Production in Canada

This Article Covers the Preliminary Figures for 1918, Mentioning the Various Metals, Such as Copper, Gold, Silver, Platinum, Nickel, Iron, Steel, etc., and Where These Metals Were Mined

"The usefulness of statistical data on mineral production," says the preliminary report for 1918 of the Canadian Department of Mines, "is greatly increased by the promptness with which the records can be presented to the interested public." Acting on this principle, estimates, based on the periodical returns made to the various war boards organized by the Government were put together at the end of the year. These estimates, further revised and supplemented, have now been issued as a preliminary report—"still subject to revision." The department, in this way, has secured prompt presentation of the broad results of mineral production.

The total value of the metal and mineral production of Canada in 1918 was 210,204,970 dols., an increase of 20,558,149 dols., or 10.8 per cent. on the values for 1917. In comparison with 1913, there was an increase of 44.3 per cent. Though much of this increase in values is due to higher prices, "it is satisfactory to note that, out of about forty-five items or products no less than eighteen products have reached their highest production in actual quantity during 1918 or 1917." Cement, stone, bricks, and other building materials fell off by about one-half, but the war demand led to large increases in metals, various non-metals and fuels. Half the total increase in value, as compared with 1917, was due to the higher prices obtained for coal, and a considerable proportion of the balance to higher prices of silver, cobalt and asbestos. Metal production in 1918, valued at 113,563,111 dols., increased by 7,107,964 dols., or 6.7 per cent. The metals—cobalt, copper, lead, molybdenum, nickel and zinc—all increased in quantity. Gold and silver slightly declined. Non-metallic production, valued at 96,641,859 dols., increased by 13,450,185 dols., or 16.2 per cent. Most of these non-metallic products—except clay and stone quarry materials—increased in quantity.

Copper

Copper production in 1918, which amounted to 118,415,829 lb., increased by 8.4 per cent. in quantity but decreased by 1.8 per cent. in value. The high mark of 117 million lb. in 1916 was passed. The average price of copper in 1918 was 24.628 cents per lb., against 27.180 cents in 1917. Of the total production 92,769,167 lb. were contained in blister copper and in matte produced in Canada, and 25,646,662 lb. estimated as recovered from ores exported. Ontario's output of 47,047,801 lb. increased by 9.7 per cent. in quantity, and the British Columbia production of 62,858,628 lb. increased about 9 per cent. in quantity. The total amount exported was 60,536 tons (of 2,000 lb.) against 59,961 tons in 1917.

Gold and Silver

Gold declined slightly in quantity. The amount was 710,526 fine ozs., as compared with 738,831 fine ounces in 1917. Ontario produced 411,270 ounces, or about 57.8 per cent. of the total production of Canada. British Columbia yielded 187,069 ounces, as against 133,742 ounces in 1917, an increase of about 40 per cent., due to increased activity at the Rossland Mines and to the entry of the Belmont Surf Inlet Mines. The Yukon gold output fell by 42 per cent. to 102,382 ounces, and was much below the average for the past ten years. Gold exports were valued at 10,040,813 dols., as against 15,929,051 dols.

The production of silver is estimated at 21,284,607 fine ounces, valued at 20.597,540 dols., as compared with 22,221,274 fine ounces, valued at 18,091,895 dols., in 1917. The decrease in quantity was 4.2 per cent., but the increase in value 13.8 per cent. Ontario's output of 17,109,389 ounces was 80.4 per cent. of Canada's silver production. Most of this silver came from the ores of Cobalt and the adjoining districts. In 1917 Ontario produced 19,301,835 ounces. British Columbia produced 3,965.828 ounces against 2,655,994 ounces in 1917, an increase of 49.3 per cent. in quantity and of 77.5 per cent. in value. The average price of silver for the year was 96.772 cents per ounce.

Platinum

The recorded production of platinum was 39 crude ounces (25 fine ounces), valued at 2,560 dols., as against 57 crude ounces, valued at 3,823 dols., in 1917. This was all obtained from Similkameen district of British Columbia. A definite record of the total recovery of the metals of the platinum group has not been obtained. The most important sources of the metals are the nickel-copper areas of the Sudbury district, Ontario, which are refined at Port Colborne, Ont., in the United States and in Wales. On the basis of the reports from the Canadian Copper Co., the total matte shipments in 1918 would contain, among other precious metals, 8,677 ounces of platinum and 13,016 ounces of palladium. The United States Government in June last fixed the price of platinum at 105 dols. per ounce.

Nickel

The amount of nickel produced in 1918 was 92,076,034 lb., valued at 36,830,414 dols., as against 84,330,280 lb., valued at 33,732,112 dols., in 1917. As usual, the nickel was chiefly derived from the Sudbury district, Ontario. The new refinery at Port Colborne started operations on 1st July last. The nickel-copper matte yielded by the smelters in the Sudbury district amounted to 86,773 tons (2,000 lb.), containing 45,670 tons of nickel and 23,472 tons of copper. The smelters of the silver cobalt-nickel ores of the Cobalt district reported a production of 243,186 lb. of metallic nickel and 962,309 lb. of nickel salts; the corresponding figures for 1917 were 265,896 lb. of metallic nickel and 657,549 lb. of nickel salts. The exports were 1,710,800 lb. of fine nickel, at 41.3 cents per lb., and 85,767,700 lb. of nickel in ore, matte, etc., valued at 12.3 cents per lb.

Lead and Zinc

Lead amounting to 43,846,260 lb. was produced in 1918, as against 32,576,281 lb. in 1917. There was an increase of 34 per cent. in quantity, and of 12 per cent. in value. The average prices in Montreal for the two years were 9.25 cents per lb. in 1918 and 11.137 cents in 1917. The exports were: lead in ores, concentrates, etc., 22,684,100 lb. against 13,410,400 lb. in 1917, and pig lead, 7,461,700 lb., against 1,004,500 lb.

Previous to 1916, all zinc ores mined in Canada were exported for both smelting and refining, but during the last three years much of the ore raised has been treated in Canada. The total production of zinc in 1918 was 33,663,690 lb., valued at 2,746,620 dols. (8.159 cents per lb.), as compared with 29,668,764 lb., valued at 2,640,817 dols. (8.901 cents per

lb. in 1917. British Columbia yielded 31,011,164 lb. and Quebec 2,652,526 lb. The refined zinc produced in Canada from native ores was 12,278 tons (2,000 lb.), in 1918, against 9,985 tons in 1917 and 2,974 tons in 1916.

Iron and Steel

Iron ores showed a further falling off in 1918, being 206,820 short tons (2,000 lb.), valued at 863,186 dols., as compared with 215,302 tons, valued at 758,621 dols., in 1917. Most of the ore, 197,637 tons, was raised in Ontario. The quantity of ore charged to blast furnaces in 1918 was 2,242,337 tons, of which 96,745 tons were domestic and 2,145,592 tons imported—Newfoundland and "Lake ore."

Pig-iron production was 1,194,000 short tons (2,000 lb.), valued at 33 million dols., as compared with 1,170,840 tons, valued at 25 million dols., in 1917. Of the total production 1,163,520 short tons were made in blast furnaces and 30,425 tons in electric furnaces from scrap steel, chiefly shell turnings. In 1917 the blast furnace output was 1,156,789 tons, and the electric furnace production was 13,691 tons. In Ontario the blast furnace pig iron made was 748,258 tons, as against 684,642 tons in 1917, and was the largest amount made in this province. Nova Scotian blast furnaces made 415,870 tons, against 472,147 tons in 1917, and, with the exception of the year 1914, was the smallest production in this province since 1911. The grades of pig-iron last year were: Basic 966,409 tons; Bessemer, 15,415 tons; foundry and malleable, 181,696 tons; and electric furnace low phosphorus iron, 30,425 tons. The export of pig-iron in 1918 was 2,130 tons, and the imports 67,396 tons.

Provisional estimates of steel ingots and direct steel castings put the quantity as 1,893,000 short tons for 1918, of which 1,820,000 tons were ingots. In 1917, the production was 1,745,734 short tons, of which 1,691,291 tons were ingots. Electric furnaces produced in 1918 about 120,000 tons of steel, as against 50,467 tons in 1917, 19,639 tons in 1916, and 5,625 tons in 1915.

Coal and Coke

Although Canada has very large undeveloped reserves of coal, especially in the Prairie Provinces, the Dominion still imports the greater part of the coal consumed. The total production of marketable coal in 1918 was 14,979,213 short tons (2,000 lb.), valued at $55,752,671, and, except for the output of 1913, was the largest quantity raised in any one year from Canadian mines. In 1917, 14,046,759 tons were produced, valued at $43,199,831. The 1918 output shows an increase of 6.64 per cent. in quantity and of 29.06 per cent. in value. Most of the coal—11,154,251 tons—was bituminous. One mine in Alberta yielded 115,405 tons of anthracite; the remainder, 3,331,216 tons, was lignite. Alberta was the biggest producer, and increased its 1917 figures by 1,205,496 tons, or 25.45 per cent. British Columbia increased by 134,703 tons, or 5.53 per cent., but Nova Scotia fell off by 474,289 tons, or 7.5 per cent., and yielded less than in 1913 by 2,127,271 tons, or 27 per cent. The total exports of coal entered for consumption were 21,678,587 tons, valued at $71,650,584, as against 20,857,460 tons in 1917, valued at $70,562,357. Bituminous coal increased, while anthracite fell off. The consumption of coal in 1918 was 34,840,605 tons, as compared with 33,123,735 tons.

The output of oven coke was 1,234,347 short tons made from 1,945,475 tons of coal, of which 1,348,232 tons was domestic and 597,243 tons imported. The average was 0.634 tons of coke per ton of coal. In 1917 the output was 1,231,865 tons of coke from 1,928,923 tons of coal, or an average of 0.639. The estimated consumption of oven coke was 2,363,270 tons in 1918, against 2,192,373 tons in 1917. The by-product recovery ovens, which dealt with 71.2 per cent. of the coke production, yielded 10.525 tons of ammonium sulphate and 7,697,435 gallons of tar.

Petroleum

A slight increase in Canada's petroleum output has been seen during the past two years. This has been due to the development of the new Mosa field in the county of Middlesex, Ontario. From all sources 304,741 barrels (10,665,935 Imperial gallons) were produced, valued at $866,544, as against 213,852 barrels (7,484,120 Imperial gallons), valued at $542,239 in 1917. This was the largest output since 1910. A bounty of 1½ cents per gallon is paid on the marketed amount of crude oil from Canadian fields. Ontario's production was 288,692 barrels, or 10,104,220 Imperial gallons. Complete returns of the oil refineries have not yet been received, but in 1917 nine refineries used 199,256,799 gallons of crude oil, of which 190,822,740 gallons were imported and 8,434,059 gallons obtained from Canadian wells. The total quantity of petroleum oils, crude and refined, imported into Canada in 1918 was 420,728,933 gallons, as compared with 379,148,006 gallons in 1917.

Other Metals and Minerals

It is estimated that the molybdenite content of ores and concentrates shipped was 377,850 lb. in 1918, as against 288,705 lb. in 1917. Quebec produced about 88 per cent.

Some six tons of tungsten ore were received for treatment at the ore-testing laboratories of the Mines Branch.

The production in 1918 of arsenious oxide was 2,483 tons and of arsenic in concentrates, 1,015 tons. This compares with 2,656 tons of arsenious oxide and 280 tons of arsenic in 1917.

During the past four years the production of asbestos has largely increased, the prices in 1918 being from three to four times those of 1914. The total output was 143,456 tons (crude and mill stock), against 141,743 tons in 1917. The average price of crude was $671.35 per ton, against $510.47, and that of mill stock $46.87, against $34.08—the whole production was yielded by the Province of Quebec.

The total shipments of chromite ore and concentrates in 1918 were 21,994 short tons, valued at $39.40 per ton, against 23,712 tons, at $24.54 per ton in 1917. The total content of Cr_2O_3 was 8,526 tons, against 8,472 tons. Thus the slightly reduced output of 1918 exceeded that of 1917 in chrome content and in total value. A feature of the year was the entry of British Columbia as a producer of chrome ore. The bulk of the quantity raised came, as before, from the Eastern Townships, Province of Quebec.

Fluorspar increased substantially, the principal production from Madoc, Ontario, being supplemented by recently opened deposits in the Yale district, British Columbia. The total amount was 7,362 tons, valued at $135,712, as compared with 4,249 tons, valued at $68,756 in 1917. Canadian steel companies use from 10,000 ton 15,000 tons per annum.

In spite of the strong war demand the output of graphite fell off. The total product was 3,051 tons, valued at $270,054, as compared with 3,714 tons, valued at $402,892 in 1917. Ontario yielded 2,934 tons.

The production of magnesite—obtained entirely from Argenteuil County, Quebec—also declined from 58,090 tons in 1917 to 39,365 tons in 1918. The price, however, advanced so much that the 1918 production was valued at $1,016,765, against $728,275 in 1917.

The output of pyrites declined from 416,649 tons in 1918 to 413,698 tons in 1917. The total sulphur content in 1918 was, however, 157,311 tons (an average of 38 per cent.), against 155,163 tons (an average of 37.2 per cent.), in 1917. Canada consumed 85,951 tons of pyrites last year, and the balance of 327,747 tons was exported to the United States.

For the first time since 1907 the quantity of salt sold from Canadian wells showed a decline. The sales in 1918 were 131,727 tons, valued at $1,285,039, as compared with 138,909 tons, valued at $1,047,792 in 1917. There was a decline in quantity of 5 per cent. and an increase in value of 22.6 per cent. The Canadian product was, as usual, entirely from the saltfield of Southern Ontario. A deposit of rock salt is being opened up in the neighborhood of Malabash, Cumberland County, Nova Scotia. This is the first known discovery of rock salt in the Maritime Provinces, and the first deposit in Canada to be discovered at a depth sufficiently shallow to enable it to be won economically by actual mining.

PAINTING CORRUGATED STEEL

The corrugated steel used for airplane hangars in this country and overseas was painted before shipment. Owing to the large quantity of steel, it was out of the question to do this work by hand, and machines could not be used on account of the corrugations. For this reason, a spray system of painting was employed. First, the sheets were coated with red lead before being corrugated, and after that they received a coating of green on one side and grey on the other side, applied by means of a jet 14 inches wide.

PART OF SEA WALL, HALIFAX TERMINALS

The Canadian Government's Ocean Terminals

The Government Are Spending Thirty Millions of Dollars on the Port of Halifax—Will Make Halifax the Best Equipped Port on Atlantic Seaboard—Considerable Progress Has Been Made

THE visitor to the port of Halifax, who has not been there for two or three years, will find vast changes. The first thing to come to his notice on entering the city by the Government Railway is the fact of the line branching off from the harbor front at the north end of the city, and making a detour through about two miles of rock cutting to the new station at the south end. Here the train runs into the temporary depot, erected on the site of the new union station, which will be a beautiful granite structure. Outside of this depot there are already constructed a network of tracks for handling freight cars, communicating directly with the new quays and basins. Of the new piers and basins, the northernmost is practically completed, and is in daily use. Large coal clams for loading and discharging coal have been erected on the wharves of this basin and numerous vessels are handled daily. On the occasion of the writer's visit recently, the following vessels were observed at the wharf, loading and unloading: The "War Gaspe," "War Huron," "War Quebec," "Canadian Voyageur," and "War Witch." It is noteworthy that all of these vessels are of Canadian build, and represent both wood and steel construction. The "Canadian Voyageur" is the first of the Canadian Government's new programme, and bears the distinction of having descended the St. Lawrence at a later date than has hitherto been attempted by any large merchant steamer.

The large landing quay has been practically completed, as far as the sea wall is concerned, and its magnitude can well be realized on gazing along its length. The following general description, prepared for the Halifax Board of Trade, gives a very good idea of the extent of the whole undertaking. The illustrations show different points in the progress of the work.

Some idea of the extent of the business handled by the port of Halifax can be gathered from the statistics for the year of 1918. The customs receipts for the year were $2,261,581. The tonnage of vessels entering and leaving the port amounted to 15,836,554 tons. The value of the imports was $14,760,000, and of the exports $127,642,512. The bank clearings were $216,084,415, and the population 62,840.

Halifax, as a port of call and terminal, outgrew its facilities years ago. Steamship companies have been seeking an entrance into this port, on account of its exceptional advantages. Its port charges are the lowest on the Atlantic seaboard. Steamships of the largest type—the "Olympic," for instance—berth here without the aid of tugs and other incidental charges.

The harbor is one of the finest in the world—open all the year round, one of the easiest of access either by night or day, and also one of the best protected; a rise and fall in tide of 4 to 6 feet only.

Delegates of representative men, from the City Council and Board of Trade, from time to time visited Ottawa to discuss increased terminal facilities with the Dominion Government. These delegations were joined by some of the leading steamship men of Montreal, who have interests in the "city by the sea."

Several plans for the development of the harbor were subsequently submitted, but none of these were acceptable, being considered entirely inadequate, in view of the yearly increase in port tonnage, etc. At that time, the port was equipped with ten berths, capable of accommodating the largest ocean liners of the day and increased accommodation for sixteen steamships only.

In May, 1912, the Government placed the whole matter in the hands of Mr. F. W. Cowie, B.A., Sc. M. Inst. C. E., of the Montreal Harbor Commission, as consulting engineer, and Mr. James McGregor, A. M. Inst. C. E., A. M. Can.

CONSTRUCTION WORK IN TERMINALS

PREMIER BORDEN LAYING STONE.

Soc. C. E. The latter, who had previously been with the Grand Trunk Pacific Railway on construction work in Western Canada and also had considerable experience in the building of terminals in some of the principal ports of the world, was appointed resident engineer.

He selected a site, formerly known as "Fresh-water" at the extreme south end of the city and bordering on Point Pleasant Park, and planned a landing quay 2,006 feet long and five piers, 1,250 feet long by 360 feet wide, with basins 360 feet between, the whole scheme occupying a mile and a half of water front, within twenty minutes steaming from the Atlantic ocean and considered one of the best sites in the harbor front for the purpose. The plan gives berthing accommodation for twenty-seven Atlantic liners of the present largest type, and the total area used for the locating of these mammoth piers is 260 acres, of which 198 acres is of land and 62 of water. The piers will have a depth alongside of 45 feet of water at a low water of ordinary spring tides.

The quay and pier walls are unique of construction on this Continent, consisting of cellular reinforced concrete blocks 31 feet wide, 22 feet long and 4 feet 1½ inches in height, and weighing in the neighborhood of 64 tons each; those blocks, facing the bulkhead passenger landing quay and piers, are being placed one on top of the other, thirteen in height, some of the cells being filled with concrete and some with rubber; thus the entire project will have a concrete facing of 30 feet in width, its entire length faced with granite from one foot below the low water mark upwards.

For the purpose of moving these immense concrete blocks a powerful travelling crane is used. First, however, a foundation under water is laid by means of a diving bell with a working chamber sufficiently large for eight or ten workmen to move easily about on the bottom of the harbor. After rock bottom is obtained, concrete bases of about 6 feet square are built, on which the blocks are placed by being lowered by the crane; this crane travels along on the concrete blocks already laid.

The concrete blocks are so formed that each stack of blocks by being cemented together by the concrete placed in the cells forms a unit, but each stack is a separate unit kept together by concrete diamond shaped piles, used as keys and guides in placing. Thus the units are allowed to expand and contract—there being practically the same contraction and expansion in concrete as in steel.

The plan also calls for up-to-date immigration quarters. This building will be 800 feet long, built of granite, and with the best appointments procurable. It is in direct connection with the Union Passenger Station.

The Union Passenger Station, with concourse and train sheds for ten passenger tracks and sufficient room for future extension when required, will be of granite and of very fine architectural design. The contour of the land will place the main floor on the same level as the landing deck of a first class Atlantic liner, consequently no steps to ascend or descend. The baggage and express will be handled underneath the main concourse. The appointments of this building will be in keeping with the entire scheme and the cost of this building, alone, in the neighborhood of $2,000,000. Each of the piers will have four large freight sheds with tracks on either side and eight tracks the entire length. There is a grain elevator of large capacity and most modern type to be built in connection.

The well-known construction firms of Foley Bros., Welsh, Stewart & Fauquier, who have been engaged in large railway undertakings in the West, and the Cook Construction Company and Wheaton Bros., Limited, have been working on these mammoth docks and railway connections for three years, and sufficient progress was made in pier construction for the docking of four steamers the past winter.

The plan also calls for direct service yards, with sufficient car storage accommodation, round house, and otherwise equipped.

The whole scheme is connected with the present railway by a cutting travers-

CORNER OF NEW BASIN.

ing the western section of the city, and meeting the present main line at Fairview. At the latter point a terminal yard is being built, a mile and a half long by 300 feet wide, with standing room for about 2,000 cars.

The present terminals at the north end of the city, also at Richmond, consisting of ten berths, with all rail facilities, etc., will continue to be used—those at Richmond for bulk freights, such as lumber, etc. At the latter point a concrete pier (New No. 2) was completed in 1915, 700 feet long by 245 feet wide, containing two tracks within the shed and one on either side, without. The shed on this pier, also, of concrete, is of two storeys, the lower storey having two freight platforms, 90 feet wide, the entire length of the pier; upstairs is fitted for immigration quarters, etc. This pier cost, completed, $1,250,000.

The increases in the port's business, of late years, have been enormous—the imports and exports of 1913 totalled $26,979,816 and in 1918, $142,402,512.

With Transcontinental railway lines seeking an entrance into this city, an average increase in shipping tonnage of practically 2,000,000 per year during the past five years, will give some idea of how the port of Halifax is forging ahead.

The building of the new terminals and the area used, meant the re-housing of a large number of families, as it contained 111 dwellings, and consequently, has increased the building boom in other sections of the city. Building permits in 1915 were over $250,000 in value, in excess of the previous year and a relative increase in 1916. In 1918 they totalled $2,955,406.

THE BASIN UNDER CONSTRUCTION.

WORKS READING ROOMS

One of the beneficial results of the war has been the broadening of the basis of relationship between the employer and his workmen. Welfare schemes have been created with the direct object of giving the workers a more comfortable life, and they have had the indirect result of increasing output. They represent a growing consciousness that the aim of employer and employee is ultimately the same. It is now quite common for engineering firms of any considerable size to have a canteen where a good meal can be had for quite a nominal figure, and it is rather surprising that such firms, while recognizing the value of catering for the material needs of their workers, fail to provide reading rooms, or even a distributing centre, especially of a technical nature. A very large proportion of men and women do not live near the works, either because housing accommodation is bad or because another district is desirable, and those men and women, after eating their breakfast or dinner, idle at street corners, play cards, or sometimes frequent the bars of public houses. Apart altogether from the waste of time, the moral effect is bad. It is these also who are away from home all the day, and perhaps who have a long journey to and from work, who have least inclination to read and study in the evening. The consequence is that they do not keep abreast of the times by reading technical journals; they lose their grip of fundamental principles and their value as producers is lessened. Oftentimes also, in the highly skilled trades, where every new task requires a special effort and much thought, it would be a real boon, and probably result in saving of time, if suitable books could be referred to during meal hours.

Very few of the free libraries cater as they might do for the technical reader, and they are usually adjacent to large works, so they are inaccessible in the short meal hour. By the institution of works reading rooms and libraries there would be no overlapping. The greatest difficulty in a large works is to provide a sufficiently large room, but this difficulty can be surmounted by dividing the library into two sections—a student section and a general section. A large room should certainly be provided for apprentices and others who can prove that they are bonafide students and attending classes at a technical school, but a smaller room with a counter will suffice for passing over periodicals and text-books in exchange for a "tally." It is possible to dispense altogether with this counter by a distributing scheme through the shop. The outlay which such a library scheme would involve would be small compared with the gain which would accrue from it. One or two attendants would be necessary. The initial cost would be considerable, of course, because it would be necessary to provide the best and most up-to-date technical literature, but the workers would willingly pay their share of such a scheme. Under the Whitely scheme, industrial councils will shortly be formed in all works, and these industrial councils could form a sub-council or committee for library supervision. This would place works libraries on a democratic footing and ensure that only the most suitable matter would be taken. Workmen are naturally suspicious of any new suggestion or schemes which are administered solely by the employers. It has so long been the custom to regard their interests as inherently antagonistic that the only way to allay suspicion and prove the genuineness of new ideas is by a mutual sharing of responsibility.

On the other hand, works libraries such as they have been outlined above would speedily result in a scientific class of craftsmen, and they would not affect adversely the sale of technical literature. The demand would be whetted, because it is a proved adage that the appetite for knowledge grows by being fed, and the favorite book or periodical at a library is likely to become the favorite one at home. The reading public grows steadily, and if we are to retain our world supremacy as a nation it will be well to divert the reading tendency into the best channels.

SECURING HANDLES TO BOXES

By M. E.

The transport of heavy boxes is often difficult, owing to the ordinary drop handles being of small dimensions, which prevents more than one man from assisting when removal is required, while if wood strips are attached at the sides with projecting handles they take up extra space and are in the way when not in use.

A simple method will obviate this. A short handle is formed and secured with a bolt and nut to the sides of the box with a small block of wood fixed above.

Immediately the handle is lifted up in position it rises against the block and is thus secured in position when required to be removed. The bolt must be fitted so as to allow the handle to rise and fall.

WELDING AND CUTTING

Welding Performed on Cylindrical Bodies

An Article Covering the Welding of Seams, Also the Welding of Head and Bottom Into Cylindrical Bodies

By ERNEST SCHWARTZ

Welding of Cast-Iron Boilers (Fig. 3, L and M)

(L) One of the sections was fractured as indicated at "A." As a new section was not easily obtainable, it was decided to attempt welding by the electric process. Three attempts were made, and these appeared to be satisfactory and stood for a time, but at a later date the repair gave out and it was finally decided to replace the boiler rather than go to further expense in welding experiments.

(M) A short fracture occurred in one of the sections of a cast-iron hot-water circulating boiler. This was welded in position by the oxy-acetylene process. The welding was apparently satisfactorily completed, but on cooling down, the section suddenly fractured with a sharp report close to the welded part, this being evidently due to contraction stresses. The section was, therefore, at once put back into the furnace and the fire allowed to die out. It was stated that the cost of carrying out this form of repair was about equal to the cost of a new section, but it was reported to have been successful in operation, and this was very useful under war conditions when new sections could not be obtained.

General Observations on Welding Repairs to Steel and Wrought-Iron Boilers

The experience of the National Company had shown that welding repairs could generally be successfully carried out to the common grooving of end-plates over the furnace connections, and to defects in the flue-tubes and parts under compression. The company did not generally approve of any extensive welding repairs in parts under tension, such as external cylindrical shells of steam-boilers of steel or wrought-iron. In such parts the extent to which the repair had been approved was in filling up local pittings and similar small defects.

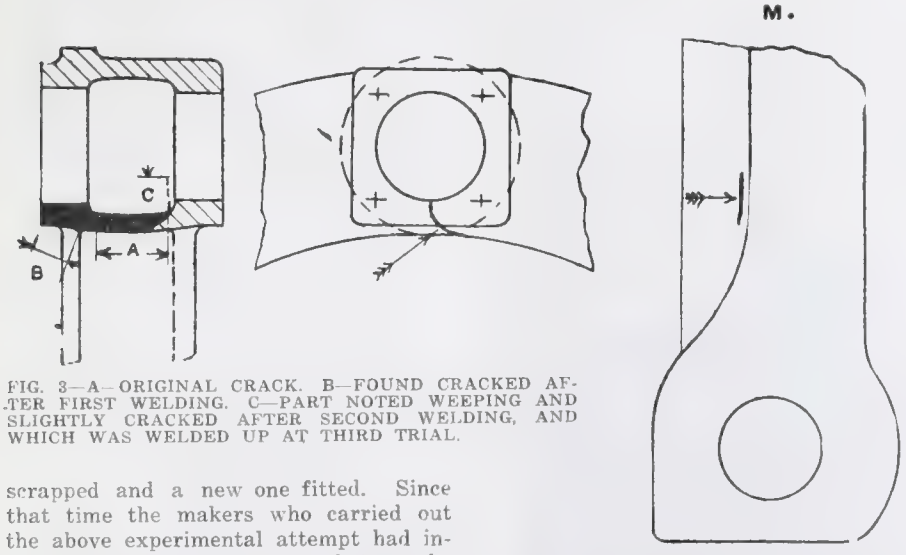


FIG. 3—A—ORIGINAL CRACK. B—FOUND CRACKED AFTER FIRST WELDING. C—PART NOTED WEEPING AND SLIGHTLY CRACKED AFTER SECOND WELDING, AND WHICH WAS WELDED UP AT THIRD TRIAL.

Welding Repairs to Cast-Iron Engine Parts

The foregoing notes referred to repairs attempted to boilers of various kinds. In those repairs generally the National Company was not so much interested in the question of paying for the repairs, but rather in assisting the boiler owners to get the boilers made satisfactory for work with as little delay as possible. The following notes on attempts to repair engines by welding referred to cases where the engines were insured against breakdown by the company, and welding was adopted for repairs, not only with a view of expediting the repairs and getting the engine to work again in the insurer's interest, but also with a view of reducing the cost of the repairs to the company. Some of these repairs had been quite satisfactory, although they had not always proved to be as cheap and as easily effected as the welding firms anticipated. Brief notes of some repairs of this class follow.

Welding of Cracked Castings (Cast-Iron) (Fig. 4, N to Z)

(N) 16-inch Gas-Engine. — Jacket cracked. Welded by oxy-acetylene process. Repair took some time, but welding was satisfactory.

(O) 10-inch Gas-Engine.—Breech-end fractured and welded by oxy-acetylene process. Casting gave out again by cracking at the same place six months later. Welding unsatisfactory.

(P) 22½-inch Gas-Engine. — Piston cracked at back end and oxy-acetylene welded. Welding seemed satisfactory, but piston was 5-16-inch oval due to the welding, and consequently a new piston had to be ordered. Welding a failure.

(Q) 9-inch Ram Hydraulic Cylinder for Lift.—Welded by oxy-acetylene process. When repaired and put to work, another crack occurred near the old one when the working pressure of 1,100 lb. was in use. Welding was a failure, and a new cylinder had to be ordered.

(R) 10-inch Gas-Engine. — Jacket cracked longitudinally, repaired by oxy-acetylene process, but gave out again at same place immediately on being put to work. Welding was a failure.

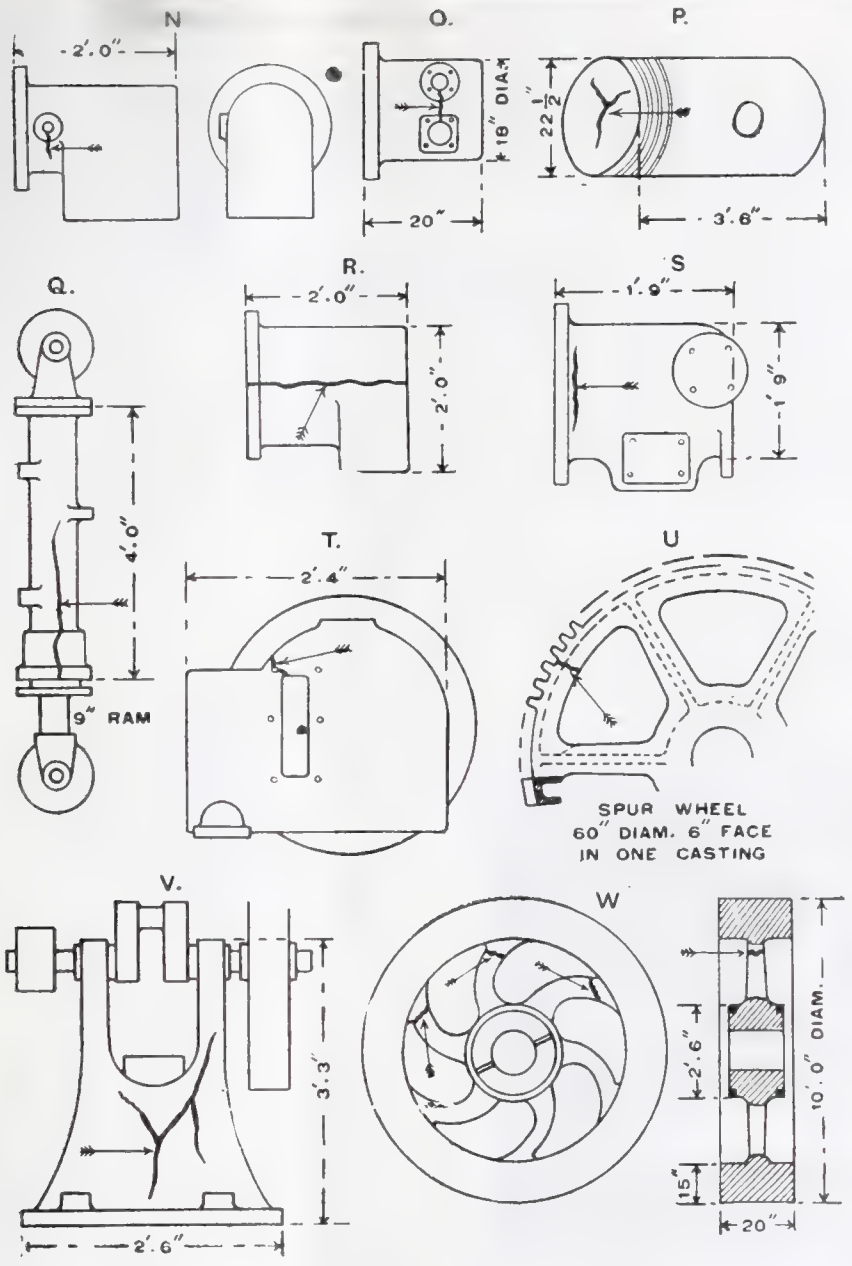


FIG. 4—WELDING OF CRACKED CASTINGS (CAST IRON)

(S) 12½-inch Gas-Engine.—Cracked round the flange. Repaired by oxy-acetylene welding. Repair satisfactory, and cost £15 against £50 for a new casting.

(T) 14-inch Gas-Engine.—Crack in breech-end. Repaired by oxy-acetylene welding. Repair satisfactory.

(U) Spur-Wheel of 3-Throw Pump.—Broken through rim. Repaired by oxy-acetylene process, the whole wheel being heated. The welding appeared satisfactory, but after three weeks' work it cracked again in the neighborhood of the weld, and a new wheel was ordered. Welding was a failure.

(V) 6-inch Vertical Gas-Engine.—Jacket cracked and repaired by oxy-acetylene welding. Repair satisfactorily carried out. As the engine was of an old pattern, and the maker's patterns had been destroyed, the successful welding in this case was of great advantage.

(W) Gas-Engine. — Fly-wheel fractured at 3 spokes. Oxy-acetylene welding tried, but was unsuccessful. Electric welding was then tried, as the makers thought the heat would be more local. After welding it appeared satisfactory, but cracked suddenly two hours later on cooling. Both methods of welding in this case were unsuccessful, and a new wheel had to be ordered at a cost of about £500.

(X) (Not Illustrated.)—Diesel cylinder-head cracked between the fuel and exhaust opening. Repaired by oxy-acetylene process, but casting distorted and hard places at the valve-seats; in consequence the casting was scrapped. Welding was unsatisfactory.

(Y) (Not Illustrated).—Diesel cylinder head cracked and repair failed, owing to the distortion of the casting and the difficulty of regrinding the valve-seats to make them perfectly tight.

(Z) (Not Illustrated).—Standard of a small vertical steam-engine broken across and successfully repaired by oxy-acetylene process.

PROTECTING IRON FROM CORROSION

In a paper read before the Iron and Steel Institute, Mr. J. N. Friend summarized as follows the results of his researches on the usefulness of paint for protecting ironwork from atmospheric corrosion: 1. The practical value of acceleration tests is very small in the present state of the knowledge on the subject. Reliable results can only be obtained from tests carried out under conditions closely resembling those prevailing in practice. 2. Addition of pigment to oil increases the efficiency of the latter as a protective paint until a maximum is reached. After this, further addition of pigment causes deterioration. The best results are obtainable from paints possessing as high a percentage of good oil as is compatible with good body and any other working property that has to be considered. 3. Linseed oil, on setting, expands by some 3.3 per cent. This is the primary cause of crinkling. Further oxidation causes a decrease in volume, which in time leads to cracking. 4. Linixyn is permeable to moisture. The permeability is reduced by heating in absence of air, the oil increasing in density, viscosity and molecular weight. 5. Polymerized linseed oil affords a better protection than raw oil when used as a paint vehicle. 6. The functions of a pigment are to toughen the film and render it less permeable to water vapour and oxygen. It also reduces the expansion of the oil on setting, and thus minimizes the tendency to crinkle. 7. A thick coat of paint protects the underlying metal more efficiently than a thin coat, provided the coat is not so thick that running or crinkling takes place. 8. The very best results are obtained by multiple coats. Two thin coats are better than one thick one of equal weight. 9. Thinners enable thin coats of paint to be applied. Turpentine leaves a very slight residue behind upon evaporation, but its effect on the efficiency of the paint is small. 10. Other things being equal, the most permanent paints are those containing black or red pigments, since these absorb the shorter rays of light and prevent them from hastening the destructive oxidation of the linoyn by the air. 11. Finer pigments afford more efficient protection than coarse pigments, since they are more thoroughly in contact with the oil. 12. Iron structures should be painted whilst their scale is still on, after loosely-adherent flakes and rust have been scraped off. The paint will last rather longer than if applied to the pickled or sand-blasted surface, and the labor of removing the scale is saved. 13. Experiments with rusty plates are not conclusive but suggest that the rust need not be so carefully removed, prior to painting, as is usually thought to be necessary.

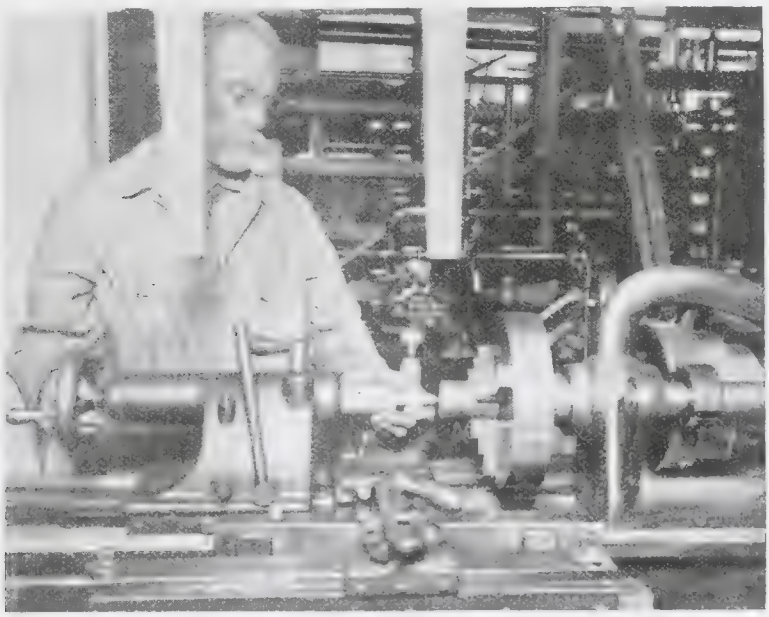
WHAT OUR READERS THINK AND DO

An Exchange of Ideas on Centering Chuck Work

These Replies to the Article Published in Our May 8th Issue Are, to Our Mind, Proof Positive That This Section is Read With Interest by Our Many Readers

Compiled by J. H. M.

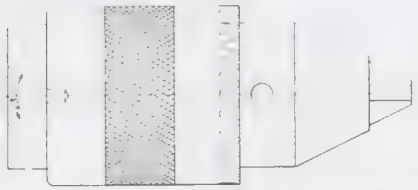
TO bring before the reader's mind the article on "Quick Method of Centering Chuck Work," which we published in our May 8 issue, we reissue the photograph and line drawing of this chuck in order that a comparison can



NOTE THE FACT THAT OPERATOR'S HAND IS HOLDING THE KNURLED PORTION OF CHUCK.

be made between this chuck and the ideas about to be suggested.

First we received a suggestion from S. Simpson regarding his views on the



VIEW OF THE CHUCK UNDER DISCUSSION

matter, so first we will illustrate by sketch his idea of improvement, together with the text matter he provided.

QUICK CHUCKING DISCUSSION

By S. Simpson

Regarding the quick method of chucking as shown in your May 8 issue.

This idea is very good as we often use a similar scheme, for it is not always possible to procure a Morse taper sleeve.

Yet such a scheme has its disadvantages, for first, it is difficult to tighten the chuck with the hand so that the drill will not revolve or push inside the chuck when feeding up to the work. Then again there is a second difficulty, namely, that the chuck as illustrated must be held in the hand by the knurled portion, which, upon pressure being applied to the drill, tends to cause the chuck to loosen, as the torque or twist is from the drill, rather than from the chuck. We overcame these difficulties, however, by arranging in the manner shown on the accompanying sketch, Fig. 1.

We tightened the chuck in the vise as

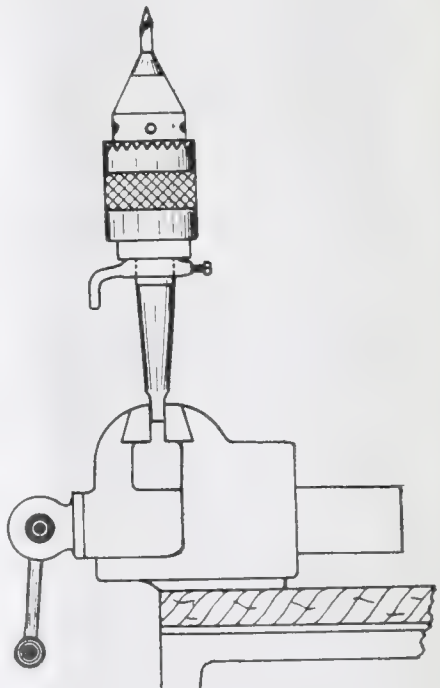


FIG. 1—THIS IS HOW S. SIMPSON BELIEVES IT SHOULD BE DONE.

shown, also used a lathe dog on the straight part of the chuck shank, holding the chuck by this dog while drilling in the lathe.

So now, since we have presented Mr. Simpson's views, let us go on to the second suggestion received, and which came all the way from Nova Scotia.

QUICK CHUCKING DISCUSSION

By Cornish

Regarding your article on quick method of chucking, I believe that the idea has not been carried out sufficiently, but that the tool as shown has limitations as to its usefulness.

My suggestion would be as follows:

Make up a combination drill and countersink holder in the manner shown in Fig. 2, and knurl the portion B shown

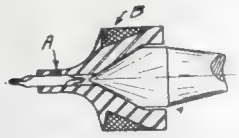


FIG. 2—ANOTHER SUGGESTION FROM CORNISH.

in the illustration. A is simply a small set screw to hold the centre drill securely.

In this way you increase the usefulness of this tool at very little additional cost.

How about it, readers? Do you agree with the above authors, or have you still a better suggestion? If so, pass it along. Remember we pay for ideas and work them up into shape for you, even to the finishing up of the sketches, so take a stab at it and try your luck at submitting material to us.

It need not necessarily be on the above subject but can be on any idea you have seen throughout your experience, so get that old brain working and we feel sure something will arrive to us in the near future.

One reader sent in a note this week mentioning that this was his first attempt although he had been reading CANADIAN MACHINERY for some considerable time.

His first attempt was successful, so no doubt when he reads this he will say, "Why didn't I start before?" This about covers the matter, for all you need is a start. Make up a sketch and send us your ideas, we will do the rest.

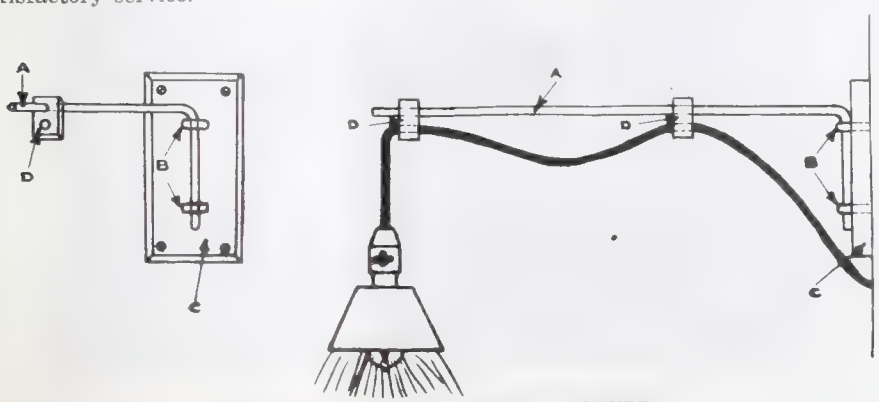
NOVEL ELECTRIC LIGHT BRACKET

By H. Scott

A novel electric light bracket which has proved of considerable value throughout the shop is shown in the accompanying sketch.

The swinging arm A is held by the holders B, which in turn are fastened to the block of wood C. This block is fastened by screws directly into the wall. From these points readers will gather that this fixture is used on the bench.

The position of the lamp is controlled by the cord passing through the holes in the wood blocks D. This fixture is quickly adjusted and is giving very satisfactory service.



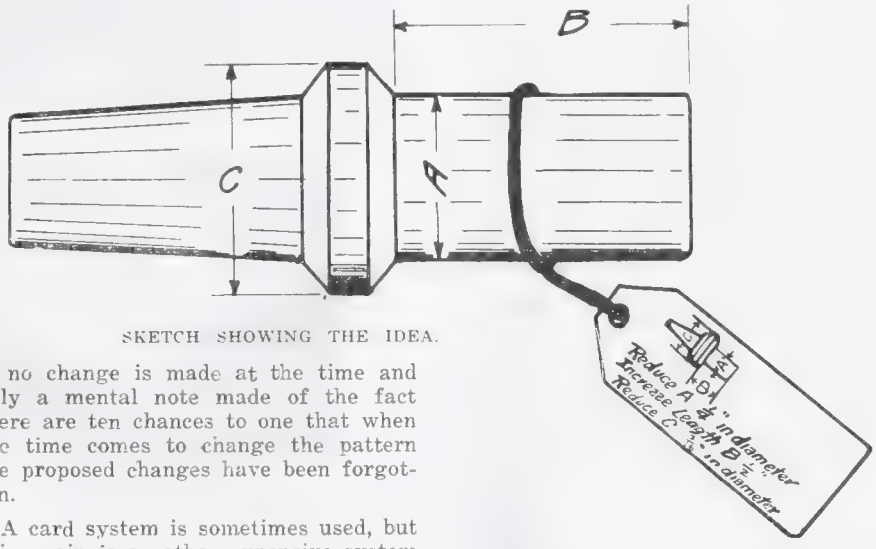
GENERAL VIEW OF THE LIGHTING FIXTURE.

KEEPING TAB ON THE PATTERN CHANGES

By J. H. Moore

The problem of changing patterns is often a many-sided one, for it sometimes happens that while you wish a pattern changed there is no immediate necessity for its being changed. This is especially true in the case of special machinery, where if any further machines are made certain changes must be made, and yet should not repeat orders come in, the cost of changing these patterns would be a total loss.

From this, some readers might say: "Well, don't change it." Quite true, but



SKETCH SHOWING THE IDEA.

if no change is made at the time and only a mental note made of the fact there are ten chances to one that when the time comes to change the pattern the proposed changes have been forgotten.

A card system is sometimes used, but this again is a rather expensive system to keep up to date.

About the simplest method of following up such changes that the writer has ever come in contact with is shown at Fig. 1. Here we see a pattern which requires certain changes. A tag is attached on the pattern and a little rough sketch drawn on this tag and lettered as shown at A, B, and C.

For example, we will suppose we are now looking on the tag, on which is a sketch similar to our Fig. 1. On this tag is also marked the following:

Reduce A ¼ in. in diameter.

Increase length B ½ in.

Reduce C 3-16 in. in diameter.

Here in a nutshell we have all the changes desired, and it does not matter how long a space of time ensues between the date the tag was put on and the date of actual change, the instructions will be perfectly clear. Such a system as this requires no upkeep expense to speak of other than the initial cost of the tag, and is adaptable to almost any conceivable shape of pattern. Readers would do well to look around and see if they could not use to good advantage such an idea.

HOW TO ERASE TRACING CLOTH

By M. L. TURNER

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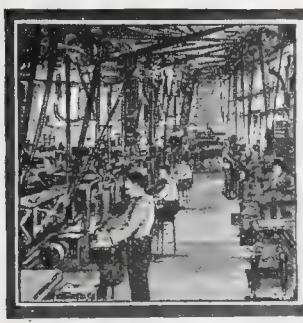
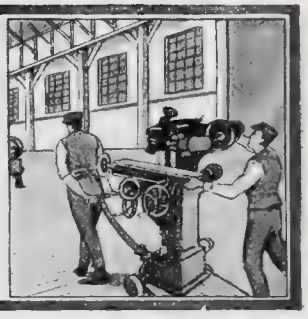
Most draftsmen have observed that when erasures are made on tracing cloth sometimes the cloth wrinkles and sometimes it does not. Very few, however, understand the reason for this phenomenon and do not know how to guard against it. The following explains: In weaving the cloth, the strands which run lengthwise in the finished product are always held taut. But the threads which lie crosswise in the finished cloth are not drawn as tightly in the weaving as those which run the long way of the strip. Therefore, if in erasing the eraser is always moved in a direction parallel with these tight threads, wrinkling will not occur. On the other hand, if the erasure is made across the tight threads, the cloth will wrinkle. A simple verification of the fact that the lengthwise strands are tight and the crosswise strands are loose is this: Tracing cloth when ripped lengthwise will tear in a relatively-straight line. On the other hand, if an endeavor is made to rip it crosswise, the resulting tear will be jagged and without regularity.

CONCRETE DOCK GATES

Owing to the scarcity of timber and steel during the war, the gates for a private dry dock in England were made of reinforced concrete. The dock is 40 feet wide and the gates are 14 feet deep. They are circular in form and despite the 14-foot head of water, are only 3½ inches thick. No waterproofing compound was employed, and yet they are said to be perfectly watertight.



DEVELOPMENTS IN SHOP EQUIPMENT



PORTABLE CONVEYORS REDUCE COST OF HANDLING COAL AND ASHES

TO secure economical operation and greater efficiency in handling material, labor must be supplanted by machines, and those selected which are best adapted for the particular work. Men with wheelbarrows are too costly to use in storing, moving or loading material, but, at the same time, the old style conveyors required a great deal of labor in shovelling the material up into the receiving hoppers.

A new type of portable conveyor, which cuts the labor of feeding one-half, is shown in the accompanying illustrations. The most distinctive feature of this machine, called the scoop conveyor, is the scoop on the feeding end, which can be pushed or completely buried in the material to be conveyed. This makes it possible to simply scrape the material onto the carrying belt, instead of lifting it up by shovelfuls into the feeding hoppers of ordinary conveyors.

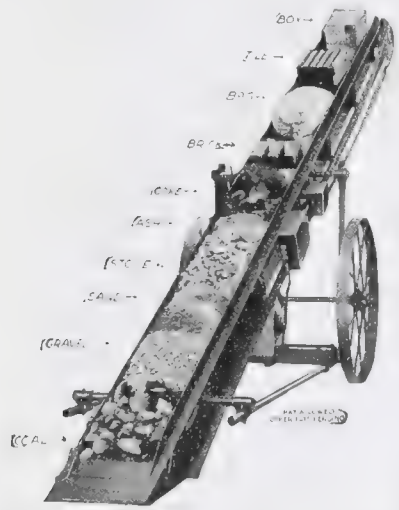


FIG. 1 A 19 FT 8 IN. CONVEYOR EQUIPPED WITH 16 IN. WIDE BELT AND DRIVER BY 2 H.P. MOTOR.

Another exclusive feature of this machine is the construction of the sides or skirt plates, as they are called. These form a trough, which enables a 12-inch wide belt to equal in carrying capacity a 20-inch ordinary troughed belt. This is readily understood when one remembers that on a troughed belt the material is carried in the centre or trough, that on the sides falling into the trough or rolling back, whereas the side plates on the scoop conveyor hold the material together, giving the whole width of the belt carrying effectiveness. It is due to the skirt plates, also, that a 24-ft. long scoop conveyor will convey material as high as a 30-ft. troughed belt. The resultant saving in belt expense is considerable, as two new 12-inch x 24-ft. scoop conveyor belts can be purchased for the price of one 20-inch x 30-ft. troughed conveyor belt.

Actual Savings

The money savings resulting from the use of a scoop conveyor are due, first, to the saving in labor; second, to the speed at which material is conveyed. In comparison with handling material by hand, one or two men with a scoop conveyor will do the same work as from four to twelve men, depending upon conditions. The scoop conveyor will load trucks in one-fourth to one-sixth the time required by men shovelling. It often enables one truck to do the work of two trucks and of getting two days' work done in one day.

Storage capacity is another factor of saving attributed to this machine, as it increases the available capacity of a shed or yard space by enabling the men to pile higher.

FIG. 2 UNLOADING FROM WAGON TO STORAGE PILE.

A few statements of actual savings made by the use of portable conveyors may be of interest:

Gay Bros. Co., (Cavendish Woollen Mills), Cavendish, Vt. One man now used instead of four to pile coal for storage and to move it into boiler house. Average saving is $7 per day.

Baird Machine Co., Bridgeport, Conn. Reduced yard force from five men to one. Now unload coal from cars quickly, without having to pay demurrage charges.

FIG. 3 LOADING TRUCKS WITH A CONVEYOR.

Fonda Glove Lining Co., Fonda, N.Y. Load from 2 to 3 tons of soft coal from ground into auto trucks in from 3 to 5 minutes.

Colonial Steel Co., Pittsburgh, Pa.

FIG. 4 UNLOADING FROM COAL CAR TO STORAGE PILE WITH A SCOOP CONVEYOR.

Unload coal from hopper cars with scoop conveyor at 50 per cent. of former cost. They figure machine has paid for itself more than once in a year.

J. L. Prescott Co., (shoe polish manufacturers), Passaic, N.J. Former cost of unloading coal from cars and putting it into storage bins was 28c per ton. It is now done with a scoop conveyor at 4c per ton, or a saving of 85 per cent.

Marcus S. Wright, (miner of foundry sands and clays), South River, N.J. Before using the scoop conveyor employed 6 men to load railroad cars. Now do the work with 3 men and get out larger tonnage. Load 150 to 175 tons of silica sand into cars with scoop conveyor in a 9 hour day with 3 men, which was impossible with 6 men working without the machine.

Capacity and Uses

The carrying capacity of the scoop conveyor, based on handling coal, is one ton per minute, provided a sufficient amount of coal is maintained at the receiving end of the machine. If the storage pile is of sufficient height, one man can easily feed one ton in one and a half minutes, or if the pile is low, he may require from two to four minutes. Where speed is required two men may be provided for feeding. In unloading hopper bottom cars the machine and one man can remove one ton per minute.

Large size coal, coke, crushed stone, etc., fed by one man, require from three to six minutes for one ton, or half that time with two men.

The scoop conveyor is used principally for storing, reclaiming and loading bulk material and light articles. There are an unlimited number of uses for the machine, in addition, such as elevating material to tanks or platforms in chemical and industrial works, feeding from cars and delivering into fixed conveyors or stoker magazines at power plants, etc. Almost any kind of material can be handled, such as coal of all kinds, ashes, sand, earth, crushed stone, blast furnace slag, ore, fertilizer, salt, chemicals, grain, bags and light packages.

The scoop conveyor may be used singly, in tandem or in triplicate, as may be required. The employment of sets of two or more allows for an increase in height of the storage pile or conveying distance. Fig. 5 illustrates three machines unloading coal from hopper cars up a long steep incline.

Construction

As may be seen from Fig. 1, the scoop conveyor is strongly constructed, light in weight, compact and portable. The steel frame holding the rollers and conveying belt is mounted on the wheels so the balance is perfect. One man, by inserting the pipe handles into the ends of the horizontal members, can easily lift and move the machine around.

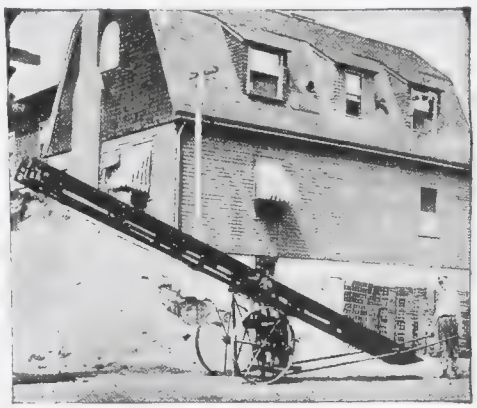


FIG. 6—ONE MAN CAN MOVE THE SCOOP CONVEYOR FROM PLACE TO PLACE.

The electric motor or gasoline engine mounted under the frame transmits power to the conveyor by means of a chain and sprocket connection to a shaft extending beneath the conveyor. From a sprocket on the other end of this shaft the power in turn is transmitted to the driving sprocket, located at the upper end of the conveyor.

The carrying belt is a high grade of heavy duck and rubber conveying belt and duck cross strips. These transverse cleats are provided to prevent the material from slipping back down the incline.

The scoop conveyor is made in three different sizes: 13 ft. 8 in., 19 ft. 8 in., and 24 ft. The width of the conveying belt on any of these sizes may be either 12 in. or 16 in. wide, as desired. Size 13 ft. 8 in. elevates to a total height from the ground of 5 ft. 9 in.; the 19 ft. 8 in. size may be adjusted for any height from 6 feet to 9 feet, and the 24 ft. size may be adjusted for any height from 9 feet to 12 feet. The machines are furnished with either electric motor or gasoline engine, or where customer prefers to furnish and install motor himself, motor support and drive from motor shaft are provided.

For catalogue and other information address the manufacturers, The Portable Machinery Co., Inc., Passaic, N.J.

COPPER EXTRACTION FROM PYRITIC ASHES

By L. P.

A new method for the electrolytic extraction of copper from pyritic ashes has just been discovered and is based on the electrolytic conversion of sulphide or sulphate of copper into cupric or cuprous chloride by the action of chlorine at the anode. If in an electrolytic bath containing hydrochloric acid in solution the anode is surrounded by a mass of pyritic scoria, the chlorine liberated by the hydrogen attacks the oxides, sulphates, or sulphides of copper more rapidly than the oxides of iron, and combines with them to form cupric chloride. This reaction extends to the entire mass of scoria, so that the latter acts as an electrode. The copper loss by this method is only 0.1 per cent.

FIG. 5 USING THREE SCOOP CONVEYORS TO UNLOAD FROM HOPPER BOTTOM CARS TO LARGE STORAGE PILE.

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Confidence Returning

ONE hears so much of strike news, of unsigned peace terms and other unsettling items, that there is sometimes a chance that we may overlook the other side of the question.

What other side? Simply this, that business is good in Canada.

Rather a bald statement, but one that can stand up and call for successful contradiction.

When you remember that the first six months after the war was looked forward to as somewhat of a nightmare, you will have to admit that you have come through it in pretty fair style.

When you pause to consider that the great war machine has stopped—and that great war machine was accounting for almost eighty per cent. of the business that was being done—you will see that there was a pretty big space there to be filled with other business.

But it is being done. There have been strikes and other differences that could not be settled. These have made the work harder, but it is proceeding.

Buying is being done now by firms who have stayed out of the market for a long time. They are buying stock, the first time in months and years. For a long time all their purchasing has been done on a hand to mouth plan.

When business was secured they immediately purchased the raw material necessary, but very little more. They were afraid that they would be caught in a falling market, and have to attend a little financial funeral on their own premises.

This feeling is going. Orders are being placed more freely, and on the understanding that the buyer gets the advantage of any concessions that are made up to the time of delivery.

Firms are going ahead and they intend now to manufacture for stock instead of immediate delivery.

They have faith that some person is going to come along soon and buy what they make. They have confidence and confidence is the one thing we have been lacking for quite a while back.

Perhaps we did not like to own up to it. Most folks do not. But the hand-to-mouth business showed it plain as day. The moves that were made in some cases looked like those of a man who had the shirt on his back bet on a game of checkers.

But that feeling is passing. The old-time confidence is coming back. Its advance agents, in the shape of bigger orders and car lots are already on the premises getting ready for the whole family to move in.

Now don't do anything that will stop this procession. If you can't help it along, at least have the good sense to get out of the road, and don't whisper in the ear of Mr. Big Order that the market is going to break.

Remember we've got a powerful lot to be thankful for. For we have come through the first of that "after-the-war" period that we dreaded so much, and we've been able to pay our way and have enough left over to look to-morrow straight in the eye with a clean sheet.

A Risky Occupation

THE Toronto *Globe* man has been figuring out the capacity of electric furnaces. Simple thing, too—just as simple as measuring snow with a stick, or stepping off a frontage with your feet.

The *Globe* goes on to say that Toronto has "the largest single electric steel plant in the world as far as known." So far so good. Then the *Globe* goes on to tell its readers just how great this great furnace is:—

"The ten six-ton Heroult furnaces at the British Forgings plant are capable of turning out sixty tons of high-grade steel per day."

Quite so, but why stop at sixty? The *Globe's* man has proceeded on the good old plan that two and two make four. Therefore, ten six-ton furnaces equal ten times six, which makes sixty! Splendid!

But the *Globe* might be surprised to know that this plant has turned out as high as 350 tons per 24 hours, even with its "sixty tons per day" capacity. As a matter of fact, these furnaces can take a heat every five hours, and if worked at anything near real capacity, can make five heats per day. Taking only sixty tons per day from such an outfit as the British Forgings have would be about the same as having a plant and staff equal to that of the *Globe* for the production of a weekly paper.

The *Globe* is quite right in stating that ten times six makes sixty, but it should also recognize that computing the capacity of electric furnaces is slightly different from painting the political situation at Ottawa.

It's The Net That Counts

MR. DOOLEY was one of the leading restaurant keepers in a small town. Recently he purchased a cash register. The documents of the first trade to be recorded were a 27-cent check and a five dollar bill, the proud proprietor rang up $5.00 and paid out $4.73 in change. When the next customer presented his check it was for 35 cents and a $10 bill was passed over the counter. Dooley operated on the $10 key. Thus things progressed throughout the day. That night, upon checking up, he discovered according to the machine that he ought to have $250.00 on hand, although a careful inventory revealed only $17.30.

"Terrance," said Dooley to his assistant, "have yez taken anything out in the new cash machine to-day?"

"Shure," said Terrance, "I took me carfare home."

"And where d'yez live," inquired Dooley, "Australia?"

Like Mr. Dooley, many a man in charge of a business is ringing up gross profits without the faintest idea of what his net profits really are. And like Mr. Dooley, if he keeps on hammering the gross receipt button, he is "going to have a disappointment in his life," as the fortune tellers say, for after all it's getting the net that counts.

A PAIR of rubbers cost about $1.50 at present, while scrap rubber is quoted at 3¾ cents per pound. There's positively no inducement to go ahead and wear your rubbers out.

* * *

THE Cost of Living Commissioner has notified bakers at Halifax and St. John to lower the price of bread. We fear said Commissioner will be looking for a new job if he makes many slips like this.

The Natives Took Kindly to the Material

By T. H. FENNER, Editor Marine Engineering

SINCE boiler pressures rose from the neighborhood of 15 pounds per square inch to the levels of 100 pounds and over, the question of scale and its prevention, or scale and its cure, has been a live one.

Elimination of scale has given rise to as many nostrums as the curing of coughs or indigestion, and most of the remedies have been made up on much the same principle. The fundamental principle of a boiler compound, like that of a patent medicine, is to make a good profit for the perpetrator, and if it incidentally achieves good while performing the larger object, so much the better.

There are so many more people than boilers that marketing the patent medicine is a much more simple business than selling the compound. Returns are so quick that much money can be spent on display advertising, and a catalogue containing a list of symptoms and a few miraculous cures will get the thing going. Another thing in favor of the patent medicine is that the human being who is afflicted, or thinks that he is afflicted, will pour anything down his throat that sympathetic advisers can think of. The more it upsets him the more good it is evidently doing. Makers of boiler compounds take advantage of this peculiar psychology in getting their medicine for congested boilers into the plant.

There are many ways of treating the scale that accumulates in a boiler, one of the best being not to allow it to accumulate in the first place. Another is by employing some recognized dissolving agency, known to be of use in these cases and possessing no harmful ingredients. Probably the worst way is to listen to the honeyed words of some clever salesman, who has never had any close acquaintance with a boiler, but possesses persuasive power of the highest order.

There is the other kind of salesman, who, after a few preliminaries gets down to business in this way. He backs the engineer into a corner of the boiler or engine room and tells him that he will split half the price of the barrel with him if the engineer will use his influence to get it purchased. Now this will not work often, but the man who employs these methods usually knows who to try them on.

I have heard of compounds that were almost human in their intelligence. They would, immediately on being introduced into the boiler, make a tour of the shell and tubes and find out just what state they were in. The compound would then remove the scale from surfaces where it was detrimental, and use some of it for plugging leaks, precipitating the remainder.

Some would both remove scale and give the boiler a protective coat against corrosion, prevent foaming, and add at least 100 per cent. to the general efficiency of the boiler.

The ingredients of course were a dark secret, but usually a pretty shrewd guess can be made. The chief constituent, as in most specifics, is water. The second is some substance that will impart a pretty shade to the mixture and at the same time give it a smell that will tend to prohibit it too close investigation. The basic ingredient is soda in some form or other. Occasionally, however, a boiler compound appears that has some intrinsic merit for other purposes than cleaning boilers, and it is about one of these that I started to write.

Some years ago I was second engineer of a steamer running from an English port to the Mediterranean. She was one of a line of six steamers, making monthly sailings. Owing to the fact that there was ample opportunity of getting fresh water cheap at all the ports we visited, and using the evaporator very little for makeup, the boilers were always in good shape. Added to this was the fact that we had always about three weeks in the home port, there was ample time to make a good job of cleaning. Under these circumstances we never thought of such a thing as boiler compounds in connection with our vessel.

We were just getting ready for sailing, on one occasion. As second engineer, I was busy getting our stores aboard, and was pretty near finished this interesting, if not worrying, task. I was in a hurry, for we were sailing on the next tide, which was about three o'clock in the morning, and I wanted to get ashore for a few hours before we left. The last barrel of oil was being emptied into the engine room tanks, and the men were unloading paint from a truck on the dock wall. Fifteen minutes would see the job finished, and I would set the men on watches, and make a break for town. A messenger boy hurried up the gangway, and asked for the chief engineer. I directed him to the chief's room, and thought no more about him. If I had only known what he carried I would have dropped him in the dock, and left him there till I got away. However, I didn't. In about two minutes the chief came up on deck, with a note in his hand, and a woebegone look on his face. I scented trouble. He came over to me, and, without saying a word, handed me a note. It bore the heading, "Superintendent's Office." I read it twice before I could believe it. This is what I read. It was addressed to the chief, and then went on, "I am sending you, before sailing, 24 (twenty-four) drums of "Ananias" boiler compound. You will use this on the present voyage, and give me a full report on your return. This compound should be at the dock when you get this letter, or immediately after. Don't fail to take it aboard." The first thing that came to my mind was, "Where can we put it?" The idea of following the super's advice and using it was far from my thoughts. I put the question to the chief. "Mr. —, he replied, "if I have to look after the ship's stores then I need another second"; with this pleasing remark he went ashore and left me to tackle this white elephant that had been wished onto us. While I was still thinking, a lorry drove down with the infernal stuff aboard. I called my men, and got it unloaded and standing on the deck, and then went to look for the mate. He and I were very good friends. "Look here, old chap," I said to him, "can you do me a favor?" "I will if I can," he replied. "Very well then. I have a consignment of stuff that I have no use and no room for. Can you put it in the forepeak?" "I'm sorry," he replied, "but the forepeak is full. Why don't you put it where you put the oil last voyage?" This was a very nasty remark, and quite uncalled for. It was like this. The previous voyage we had more oil than we could get in the tanks, and I had lashed a couple of barrels on deck till we could make room. It was summer time, and I had not anticipated any bad weather, but we got it. The result was, that on coming on watch one morning at four o'clock, I was just in time to see the two barrels floating over the lee rail. A bit of bad steering had let the vessel fall off, and she had shipped enough water on the after deck to wash my barrels out of their lashings. I had heard quite enough about those barrels to be able to dispense with any reminders.

Well, I got those drums into the engine room. Some went into the store room, and some on the top grating, and a couple on the bottom platform, round the back of the engine room, and I departed for my delayed visit ashore.

Next day, going down channel, I said to the chief, "Well, when do we start putting the compound in the boiler?"

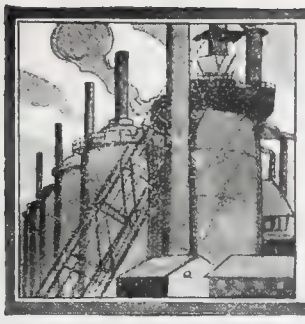
"Not so long as I am chief," he replied.

"Very well, then," I said. "Shall I dump it overboard on the morning watch?"

"Not so," said the chief. "I have an idea that we can use that stuff, down the coast."

Not knowing what he meant, I said

(Continued on page 564)



MARKET DEVELOPMENTS

Movement Starts for Buying on Large Scale

For First Time in Many Months Some Decent Sized Stock Orders Have Been Placed—Prices Show a Tendency to Conform to Demand When a Good Sized Order is in Sight

SOME of the most hopeful signs in months are to be found in transactions that have taken place during the past week. For instance, several of the Ontario firms have come into the market for boiler tubes in a big way. One order ran twelve car loads, while another was for almost five cars. Such orders have not been placed for months before. They are taken in as stock, and it has been demonstrated that all that was needed to test the real strength of the market was a good-sized order. In this case the supposedly fixed figures sagged quite a bit, as the size of the order was highly desirable.

Machine tool dealers are awaiting the placing of orders for the St. Malo shops of the National Railways. It is reckoned that the equipment there, for which specifications have been out some time, will be worth about three-quarters of a million.

There has been liberal buying of plate, too, during the past few days, and the total orders going forward to U.S. mills will make a very fair tonnage from this district. Although the market is supposed to be "open" now there are no signs of breaking the plate price of 2.65. In fact, some of the mills say that any departure from that level will be upward, as they cannot make money at the 2.65 mark. However, orders that are going over now all carry the stipulation that if there are any reductions in price by the time of delivery the Canadian buyer will be entitled to get the benefit. Of course, that is a very reasonable stipulation and no objection can be taken to it.

Pittsburgh reports an improvement in the buying of steel. The volume is greater, not tremendously so, but the movement is starting, and that is what the trade has been looking forward to. The same holds good in regard to structurals. There are lots of structurals being built at present—on paper—but more and more they are being converted into real business, and once that gains momentum the steel business is going to have a recovery that speaks well for the months to come.

The scrap metal market remains dull. Scrap rubber is also unchanged at the lowly figure of 3½ per cent. It will not improve until crude rubber moves to a higher figure. The scrap steel from the shell plants that were working on U.S. contracts is being tendered for this week, but as yet there is no intimation of the possible bids on the material.

MONTREAL SEEMS SURE NOW THAT GOOD TIMES ARE RIGHT HERE

MONTREAL, QUE., May 29. — The optimistic statements that have been circulating through trade circles since the beginning of the year are now commencing to take tangible form, and plans and developments are gradually shaping into concrete enterprises, as has been amply indicated during the past month. That these are only a beginning may well be gathered from the confidential reports that are obtained from time to time. Announcements are withheld for obvious reasons, but sufficient is frequently disclosed to indicate that reconstruction is gradually reaching a stage when production will be an actual factor of the problem. One plant here, which was one of the largest producers of British and American shrapnel in Canada, are just on the verge of new activities, and negotiations for manufacture are nearing completion.

Another local firm is expecting a reorganization of the company that will result in the manufacture of their special firebricks, a plant to be established in Montreal; this material was formerly imported.

It is reported that a large British steel company is expecting to construct a plant in Canada, and at present representatives are looking for a location in or near Montreal. A better business tone is felt in all directions, and activities are gradually showing a degree of settlement that has not been evident for many months, despite the fact that labor unrest is still pronounced. The willingness of many manufacturers to meet, in some measure, the wishes of their employees, is doing much to allay the spirit of conflict. Little change has been effected in steel circles by the recent developments in the States, and in all likelihood the coming weeks will convince the trade that the present is or was, a good time to buy, as prices are as low now as they are likely to be, with the exception of spasmodic cuts that may be made from time to time. The general level will probably be retained, or even go higher. Activity in metals has shown an increase, and in consequence the quotations on most of the metals have been advanced. Inquiry for machine tools is on the increase and the present demand is steady. Old materials are beginning to show strength and prospects are for a steadily increasing business.

Advances Create Better Demand

Steady, but gradual improvement in metals is reported by dealers here, the requirements of the trade, apparently, have slowly increased in volume, and present inquiry promises the developments of business in the near future. "The trade has been moving along quietly," remarked one dealer, "but no heavy buying has taken place, but we are pleased with the improvement of the past week or so. Few consumers have been carrying stock, and in a great number of cases buying has been deferred on the supposition that lower prices would follow the signing of peace, or the withdrawal of all Government restrictions. Peace has not yet been signed, it is true, but with the market firm, and even showing strength in some quarters, with control virtually removed, price quotations show little inclination to decline; as a matter of fact, the steady strength is beginning to influence the trade, and consumers are gradually realizing the conditions as they actually are, and confidence, seemingly, is returning, with the result that present

purchases are increasing in volume." This dealer also stated that a temporary shortage in tin had developed a stronger tone in the market, and inquiries were more numerous. This condition is probably only a temporary one, but sufficient to show that the consumer is ready for a buying movement, as soon as they are convinced of the stability of the market. The copper and spelter demand is steadily increasing and is reflected in the current quotations. Coppers have advanced one cent per lb., the range being 18½ cents for castings and electro, and 19½ cents for lake. Tin quotation are at 58 cents, an advance of 4 cents on the week. Spelter is up ½ cent to 18½ cents per lb. Lead is 7½ cents, and antimony 9 cents, a one-cent advance in each case. Aluminum is unchanged at 38 cents per lb.

Tool Business Developing

"While we cannot say that machine tool sales are heavy at the present time, we are, nevertheless, ready to say that the volume of business being placed is not at all discouraging. We are, I believe, getting our share of what is going and when everything is taken into consideration, think that the trade is comparatively good." This statement by a dealer here appears to define the existing tool situation, and while definite information may be lacking, it seems that optimism is the keynote. The dealer intimated that he believed that developments were pending that would eventually culminate into business of considerable volume, and this is the general opinion throughout the trade.

One large plant here, that was constructed for the carrying out of a large American contract on shells, is still negotiating with the principals for a settlement, part of which has been made, but little progress can be made in other directions, while these adjustments are under way. In the meantime, the plant is being used as a storehouse for much of the American Government equipment in this district. Some of the other shops are making arrangements for new business, but active operations are delayed, awaiting further developments.

Steady Improvement in Scrap

The strength that has been developing in old materials has become more pronounced and advances are more general. The demand is steady and inquiry is of larger volume. The impression that the market will show gradual, but perhaps slow improvement, during the coming month, is steadily growing. The volume of sales is not large, but the range is ample to show that no particular class of scrap is taking a leading position. As one dealer stated: "The steady improvement in business would appear to forecast a confident return to settled activity, and the sales of the past week have shown an increase in volume that has given the impression that industrial enterprise and development are returning to a more normal condition. We are anticipating a good summer's business." A few of the larger dealers here have had a considerable turnover from the disposal of equipment, purchased in bulk from the old munitions shops. Much of this was machinery and material that could be sold for special requirements, and not in the general class of scrap. Price advances in the metal scraps almost cover the complete range, light and medium brass being the sole exceptions. The advances range from ½ cent on red brass turnings to 3 cents on No. 1 machine compositions. Steel advances are less pronounced, but the strength is general. Boiler plate is now quoted at $11.00 per ton; wrought iron pipe, $9.00, and machine shop turnings, $6.00, an advance in each case of $1.00 per ton.

POINTS IN WEEK'S MARKETING NOTES

The biggest order for boiler tubes since the war has been placed by an Ontario firm. It will run 12 car loads. Another order calls for between five and six cars. The orders were large enough to secure price concessions of no small dimensions.

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Business shows improvement in several points and buying is being done on a much firmer scale.

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The specifications are out for the National Railway Shop at St. Malo, Que., and the business will run well on to three-quarters of a million dollars.

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Tenders are being asked this week for the American steel scrap from shell work stored at various points in Canada.

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Pittsburgh reports that there is an improvement in the volume of steel buying, the most noticeable in some months.

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The movement in structurals, though still small in volume, is showing a steady increase.

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Dealers admit that there is quite a departure from list prices when an order of any size shows up for supplies, such as traps, reamers, cutters, etc.

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New York machine tool firms state that business is very satisfactory. Auto trade, gramophone firms, etc., are buying a lot of machinery.

BIGGEST BUSINESS DONE IN TEN YEARS

That Is Report Of One Warehouse In Toronto on Dealing Covering The Past Week

TORONTO.—Mention has been made in these columns several times in recent weeks that confidence was returning to the market in spite of all the unsettling influences that were at work. The parting of the trade with what has been termed the fixed price period has helped to do this. Prices may remain more or less at a fixed standard for some time, but it has been demonstrated quite recently that all that is needed to bring the market back to the old competitive basis is that there shall be an order large enough to get the bidding going. There is a tendency in some lines to trim prices, and it is more marked now than for some time past. This sort of business was pretty much out of the market during the war. There was a tremendous and unprecedented demand, and the element of delivery was greater than the consideration of the price.

English Goods Come Back

English chains are coming back in the Canadian market. It has been hard to get them during the war. We refer here to the heavy chains, from one inch up, that are used for steam shovels, etc. It would be a sore touch for the Englishman to lose his chain trade, but the chances are that he is not going to do it for a while yet. There are some firms in the Maritime provinces that always use these English chains, and the trade could not be pried loose or switched to any other source. English furnaces are also in the market again, and the price is good enough to be securing a fair number of orders.

In other lines the English prices are still a little too high. There are many who claim that this is only a temporary condition, and that once peace is signed and British industries get going on a peace basis prices will come down to enable them to do business in Canada. At present, on such lines as tubes, sheets, plate, wire rope, etc., the price is from ten to fifteen per cent. too steep to get the business.

Big Buying During The Week

"Last week was the biggest business we have done in ten years." That was what CANADIAN MACHINERY was told at one of the largest warehouses this week. Business was general and it was big, and it had also served to demonstrate that there was something in existence nearer an open market than might be supposed. One Ontario firm came into the market and bought twelve carloads of boiler tubes. Another firm in Toronto placed an order that will run about six cars. Another well-known firm of boiler makers have a big order drafted to place this week. It will be for general stock of plate, tubes, etc. There is one feature in this first sale that seems particularly good just now. The

firm in question are going ahead to make boilers for stock. They seem to consider that the prices that were quoted were good enough to warrant them going ahead. Of course on all such business there is the reservation made that the purchaser gets the benefit of any price reductions that are ruling at the time of delivery. Speaking of the prices that were quoted, MACHINERY was not able to secure exact figures, but it is known that there were concessions from the lists in order to secure the desirable order.

Brass and copper products show a tendency to go up in price, and changes were made in that direction during the week. Tubes, rods, etc., are affected by this change.

Several warehouses are placing a good sized tonnage now for stock purposes. One case that we heard of amounted to 250 tons. This has not been done for some time, and warehouses have been acting more as importers, but they feel confident that conditions warrant them building up their stock again to meet the demands that will certainly be made upon it before very long.

Big Specifications

Several of the machine tool houses had imposing looking documents ready to send out this morning to the officers of the Canadian National Railways. They were on account of the St. Malo, Quebec, shops, and the chances are that the total buying for this plant will run well into a million dollars. The lists that are out call for about 75 tools, including shapers, planers, turret lathes, drill presses, grinders, complete forge outfit, spring shop, car wheel lathes. This is the best business that is offering at present, although the automobile trade comes into the market frequently as a good customer.

One customer was rather surprised to find that he could not get a chuck on short notice. He took the matter up with one firm and found that two months was the very best time that he could secure, so seeking to better himself he turned to another firm, and was informed that the business could not be touched at all before September. It seems that there was a shortage on chucks when the war was over and there was a general demand for them that has not yet been overtaken.

Dealers assert that there is considerable price trimming being done now, especially in the matter of supplies. Of course there is no open departure from the lists, but it is known that the pruning hook is put into some of the supposedly inflexible lists when there is a good sized block of business offering. It may be that, like all other markets, all that is necessary is that there should be a fairly good piece of business at stake to find out just where the market really stands.

Scrap Still Inactive

The only thing stirring in the market is the fact that there will be some interest in the disposal of the shell scrap, the property of the U.S. Ordnance Department, which is scattered all over the country, from the Maritimes to Winnipeg. There must be something like 2,000 tons of it and bids are to be in shortly. There seems to be a diversity of opinion as to what the metal will bring, and not a few of the dealers would like to secure some idea of what is liable to be bid. It is desirable material and there is a lot of it.

Otherwise there is nothing much of interest in the scrap metal market. Machinery scrap has not, as was anticipated, shown any improvement. The market for it is dull and inactive. Copper is better. Fourth quarter is quoted now at 16¾, but of course that is purely speculative. It may be up or down from that figure, but the chances look like stronger copper for the latter part of the year.

The market for old rubber, of which there is a large volume moving, is still down. Dealers only offer 3¾ cents per pound, but with the price of crude rubber still low, the chances are against anything looking like a real recovery in scrap rubber. The steps taken by the British Government, the trade says, in planting so many rubber trees has kept a large supply coming in, so great that the price of rubber actually decreased during the period of the war.

LITTLE CHANGE CAN BE NOTICED IN THE STATE OF SCRAP METAL TRADE

THE tone of the market is on the whole, stronger, though still dull in spots. The strengthening of the pig iron market has had some effect on scrap. Following are reports from U. S. points:

Chicago.—Demand is increasing and a firmer tone is becoming apparent in many grades. Heavy melting and rerolling rails are among the best in demand. Railroads offer about 4,000 tons, including a fair tonnage of steel rails.

New York.—There has been practically no change in prices, though business has been dull. Dealers having little scrap on hand are not making concessions. Clean cast borings are selling at $9.50 and city wrought long stock at $16 to $16.50. While in general supplies are not in great volume, there is considerable heavy melting metal being held in New England.

Philadelphia.—Dealers believing that present prices are low, are accumulating stocks in anticipation of a rise in prices. Very few sales are being made, but an improvement in the demand for low phosphorus is apparent.

Pittsburgh.—There is little demand for scrap in this district. Prices have shaded somewhat in most grades. Heavy melting steel is firm at $15.50 to $16 delivered. Compressed sheets have receded about $1 per ton, and machine shop turnings and cast borings have also gone back some. Malleable has no demand at all.

Buffalo.—While interest is being shown in heavy melting steel, machine shop turnings have suffered a drop of about $1 per ton. More interest is being shown in the market, and a good demand for cast scrap and stove plate is in evidence.

Cleveland.—The geneal opinion is that prices are due for a rise, and heavy melting steel is in good demand at $15.25. The sentiment is much stronger, but little business is anticipated until a couple of weeks later.

St. Louis.—There has been little actual sale, but prices remain unchanged and sentiment is good. 650 tons offered by railroads were taken up by small dealers. Consumers are keeping out of the market.

Cincinnati.—Deep dullness characterized the scrap market here. There have been no changes in prices and hope is centred in a buying market which dealers believe will develop next month.

Birmingham.—Dullness and optimism are the conditions here. The market is dull, but the dealers are optimistic. Old car and tram car wheels are now listed as not cast scrap.

PITTSBURG REPORTS IMPROVEMENT IN THE VOLUME OF STEEL PURCHASES

Special to CANADIAN MACHINERY.

PITTSBURGH, Pa., May 29.—There has been a distinct increase in the volume of steel buying. This statement applies to practically all products with the exception of tin plate, and includes even rails, since the Railroad Administration has bought 200,000 tons of rails, under protest, and there has been a fair volume of export rail business done

With only occasional exceptions, as in the case of the rails just mentioned, purchases are confined to the supplying of immediate wants. As formerly, buyers take material only for immediate delivery, for absolutely known wants. They do not buy ahead, even in the most moderate way, and they keep demanding price guarantees, although according to the statements of steel producers the guarantees are seldom given. It may be, however, that guarantees are more common than is admitted. There is a very remarkable rumor, for instance, that one mill has guaranteed a certain product to the end of the year, a still more remarkable feature of the guarantee being that it is to be retroactive, upon shipments made from the date of the guarantee being given.

No new buyers have appeared in the market, the buying being by the same interests as formerly, including jobbers and manufacturing consumers. As there

is no forward buying, and buyers had previously been withholding their orders as long as possible, it seems to be indicated clearly that general business in the United States has expanded. This may be a reflection of the progress of the season, as well as a general limbering up after the dislocations caused by the war ending, and thus it should lead to still better things in future.

Operating Rate

Since practically the beginning of the year the rate of steel mill operation has been declining continuously, the monthly ingot report indicating 87 per cent. operation in January, 85 per cent. in February, 77 per cent. in March and 65 per cent. in April, while the rate lately may be estimated at 55 per cent. There has been little fluctuation in the rate of new buying in these months, certainly no progressive decline, and the decrease in operations has been due to the gradual exhaustion of old orders. The increase in buying now noted may not be sufficient to make up for the winding up of old orders, so that mill operations may experience some further decrease, but even at that it is encouraging that part at least of the exhaustion of old orders is followed by the placing of fresh orders.

Construction Work

The construction firms and fabricating shops report that they have been estimating on very large quantities of new construction work in the past few months. The investors, however, do no go ahead with the projects. What they are waiting on cannot be conjectured, as there are many possible explanations, but it is encouraging that so much business is under consideration, for obviously these projects have not been abandoned. When conditions become satisfactory the projects will be undertaken. Either the conditions upon which investors are waiting will come or the investors will conclude the conditions never are coming and will go ahead without them.

Jobs now undertaken are small, but still they amount to something. Thus, the Bridge Builders' and Structural Society reported that April lettings of fabricated steel jobs amounted to 24½ per cent. of the month's capacity, this comparing with 17½ per cent. for March, 12½ per cent. for February and 12 per cent. for January. While the progress is slow, there is steady improvement.

Steel Prices

The great majority of steel producers insist that they are adhering to the recognized prices This may be true, but in some quarters it is claimed that on almost any finished steel product a cut price could be obtained if the prospective buyer could offer a sufficiently attractive order. Obviously on carload or other small lots for immediate shipment the mills would be indisposed to cut prices. In this connection it is to be noted that the American Locomotive Company has distributed plate orders aggregating 3,000 tons to four mills, the base price being $2.50, Pittsburgh, or $3 a ton under the regulations price of $2.65. In explanation of the cut price it is stated that this was "export" business because the locomotives will be made to go to Italy. As the British price on plates is equal to about 3.90c and the French price, if there is one, would be still higher, it cannot be said that a cut price on these plates was necessary in order to meet competition on the finished locomotives, but it might have been necessary to encourage placing of the locomotive order at this time.

Pig Iron

The pig iron market has now been under test for about two months, or since the majority of merchant furnaces declared their unwillingness to adhere to the fixed schedule of March 21, brought about by negotiations between the Industrial Board and the general iron and steel committee, on which the merchant furnaces claim they were poorly represented if indeed they were not misrepresented. There has been an "open market" in pig iron, furnaces feeling that they had no obligation to their competitors to obtain one price or another. Nevertheless prices have sagged only slightly, and in some districts not at all, while on the other hand, furnaces have been going out of blast. Probably the furnaces could afford to quote slightly lower prices, but costs are so high that they could not come down a great deal, and they prefer to let the situation liquidate itself, by production dropping below the rate of consumption. This would be necessary in the long run, since there have been stocks of considerable magnitude in the hands of consumers. Some of these stocks developed during the war, while some have been occasioned in the past few months by consumers taking iron because they had it under contract and not because they needed it. While steel producers speak of their high costs as a bar to reducing prices, the case is not altogether simliar, there being much more margin in steel than in pig iron, and if there were full operation of steel mills the cost would be still lower, through better distribution of overhead.

Connellsville Coke

Connellsville coke, famous throughout the world for years as an ideal blast furnace and foundry material, was produced to the extent of only 83,284 net tons in the week ended May 17, in the Connellsville and Lower Connellsville region, this comparing with an output averaging 324,000 to 350,000 tons during a considerable part of 1918. and with outputs running some 145,000 tons a week only a few years ago. Of course the coke production of the whole country is greatly reduced, but the Connellsville region suffers particularly at this time because so many furnaces formerly using Connellsville coke have installed by-product coke ovens at their furnace plants. They use Connellsville coal to an extent, but also coal from various other districts.

Connellsville coke is a shade stiffer than a few weeks ago, spot furnace coke being quoted usually at $4 per net ton at ovens, while not so long ago $3.50 and $3.60 were done. Ordinary grades of foundry coke, formerly available in spot lots at $4.25, now bring $4.50, while good brands remain at about $5. The usual time for making contracts for the second half of the year is at hand, but it is somewhat doubtful whether the furnaces still in operation, and not provided with coke plants of their own, will be disposed to make contracts. There is likely to be contracting for foundry coke.

NEW YORK REPORTS MUCH BETTER TRADE

Machine Tool Market is Handling a Lot of Material There at Present

Special to CANADIAN MACHINERY.

NEW YORK, May 29.—Increasing activity in machine-tool markets is apparent. Evidently buyers have become persuaded that prices are as low as they will go this year, or at any rate many of them cannot afford to wait longer to satisfy their needs. For some time the automotive industries have been almost the only buyers in large quantities but other industries are now coming into the market, and this is the most hopeful sign since the end of the war.

The Columbia Graphophone Co., Bridgeport, Conn., has bought heavily for a new six-storey building to be used for the manufacture of talking machines, its purchases totaling several hundred thousand dollars. A Cleveland maker of screw machines received an order for sixty-two, while a New England builder of grinders and milling machines received an order totaling about $100,000. Several other machine-tool builders also received substantial orders.

The Federal Shipbuilding Co., Kearny, N.J., has begun to buy, and its purchases will eventually make quite a total, as it is rounding out the equipment in some of its shipbuilding shops, and will also buy for a dry dock and ship repair plant.

Another purchaser is the New England Westinghouse Co., Springfield, Mass. This company's plant was engaged during the war in making machine guns, and now will be devoted to the manufacture of electric starters and lighters. A part of the work of this kind formerly done at Pittsburgh plants of the Westinghouse companies will be transferred to the Springfield plant.

Automobile work is also to be done at the plant of the Osgood Bradley Car Co., Worcester, Mass., This plant was engaged in making gun mounts during the war but during recent months has been almost idle. The plant is closely affiliated with the Standard Steel Car Co. of Pittsburgh and will make certain parts of the Standard Automobile. A list of about 60 machine-tools has been inquired for and probably will be purchased soon.

The Chicago Pneumatic Tool Co., Chicago, will build an Eastern plant at Franklin, Pa., and will require consider-

able equipment. The work of constructing the plant will be in charge of Westinghouse, Church, Kerr & Co., New York.

Still another war plant is being converted to peace-time production. The American Shell Co., Paterson, N.J., has enquired for machine tools for the manufacture of motors for washing machines and other similar equipment.

Inquiries have been received in New York from the Canadian National Railways for the equipping of the St. Malo shops of this road at Quebec. It is presumed here, however, that most of the buying for these shops will be done in Canada.

A proposition is now under consideration by the War Department, Treasury Department and State Department of the United States Government, which may solve the problem of re-equipping many Belgian and French factories, and at the same time result in quick disposal of about $75,000,000 worth of surplus machine tools which the War Department has on hand. It is proposed that this Government turn all of these tools over to Belgian and French manufacturers, the necessary credits to be established through inter-Government financing. The disposal of these tools in the United States has been arranged for up to a certain point, but it is realized that the problem is a huge one, and the disposal of the equipment in the manner indicated would be an easy and speedy solution, although it is admitted it would ruin the prospects of many exporters of machine tools who have in prospect considerable Belgian and French business. A great deal of machine-tool business should come to America from Belgium, especially as that country has placed an embargo against the importation of German tools, and this embargo, it is understood here, will not be removed even after the peace treaty is signed. Practically the only competition America will have, therefore, will be from England.

THE NATIVE TOOK KINDLY TO THE MATERIAL

Continued from page 559

no more. It was shortly after this that a use for all we had developed.

The fourth was doing something up on the middle grating, and dropped a 14-lb. hammer down on top of one of the drums, which it naturally went through. He came down to recover the hammer and, in his efforts to extricate it from the drum, he upset the whole thing, and our valuable compound ran all over the back platform. Now, part of this platform was of plank, and it had always been a sore point to try and keep it clean, because it was a handy place to wash before coming off watch.

The fourth got a man around to help clean up the mess and, wonderful to relate, wherever the stuff had touched, the planks were white as snow. He was so surprised that he came up after me, and I went down to look it over. The appearance of that platform was a delight to the eye. I got an empty paint pot and put some of the compound in it, and took it up on deck. I found a piece of the deck outside of the galley, that was pretty well stained, and applied the clean-all to it. In two minutes it was white.

This was too good a thing to lose. I made an inventory of my stores, and found I was a bit short of white zinc. I again approached the mate. "How are you fixed for white zinc?" I asked him. He looked suspicious, but replied he had enough. "All right then, if you will give me a couple of drums of white zinc, I will give you a couple of drums of my boiler compound." "No doubt you would," he sneered. "What use would it be to me?' This was what I wanted. "Come here and I'll show you." I took him over to the deck I had cleaned. His eyes lit up joyfully, and he called over to the bos'un, "Give the second two drums of white zinc," he ordered, "and get two drums of that stuff from below."

I told the chief about it. "Just what I thought," he said. "I have had something like that before. Now," he said, "do you savvy what we can do with it down the coast?"

"I have a glimmering," I replied.

Anybody who has ever traded down the Mediterranean can tell you the value set on soap by the inhabitants of these shores. That is because it is a government monopoly, and is scarce and expensive. We always carried a good stock of soap in our rooms and used it as a means of trade. What can be bought down there with a few bars of soap would surprise anyone who has not experienced it. Now, this compound evidently was not soap, but it would achieve some of the results. The next thing was to try it out on a suit of overalls that had done duty in the engine room for a while. A bucket of hot water, a little soft soap, and a half cupful of our compound made a new boiler suit. I gave the men a drum for their fo'c'sle, to wash their floor and their clothes, and waited eagerly for the first report.

The chief conducted the negotiations. He took the ship chandler into his room and showed him what could be done. That night three drums went ashore, and a barrel of grapes came aboard. We had a few more ports to visit, and results were very satisfactory. I suggested that we had better keep some, so as not to have appeared to use it up too fast. "My boy," said the chief, "when you have been at sea as long as I have you will know more. If we take any of that stuff back the super will fire us. It has served his purpose, as it is now serving ours. Keep a drum for your back platform, and one for the men's foc's'le, and you might trade another drum with the mate. I'll look after the rest and will be able to report that we found it easy to use and excellent in its results. Everyone will be satisfied and we will never see any more of it."

And that is how it worked out.

STRONGER TONE IS SEEN IN IRON MARKET

INQUIRIES are more numerous, and foundry iron for last half is being booked. Sales, however, are slow in increasing. The tone is, on the whole, stronger. Following are reports from U. S. points:

New York.—There has been some inquiry for third quarter and even second half from furnaces not covered for those periods. Most consumers, however, have provided well ahead. Foundry and malleable grades have been sold up to about 10,000 tons during the week. Production costs are high, and consumers are not taking more than about ten per cent. of the iron being made. More stacks are likely to be blown out.

Boston.—A fair amount of iron is being sold in small lots, from a carload to 250 tons, mostly for June and July delivery. The tone of the market is good, the aggregate sales being better than for some weeks past. No. 2 foundry sells at $26.75 for all small orders. It is thought that the worst days are now over.

Philadelphia.—Inquiries for second and third quarter requirements are on the market, one of these being for 1,000 tons foundry for last half, and another 500 tons Bessemer for third quarter. The Government has 3,000 tons low phosphorus iron which it is offering to the highest bidder.

Pittsburgh.—Business is being done along very moderate lines, although the general sentiment is better. Inquiries are coming out for last half needs. Shipments against contracts are getting more frequent and no more stacks have been blown out during the past week.

Buffalo.—The usual sales of small lots keep up, but the aggregate has improved somewhat. Enquiries for fair tonnages for forward delivery are being heard of, and some small sales have been made for last half delivery.

Cleveland.—Prices are holding firm, and more interest is being shown by buyers. Business is mostly confined to small lots, mostly foundry grades. Sales are not enough to keep up with production, and further curtailment is effected.

Chicago.—There is no interest being shown in contracts for last half. Another stack has been blown out, this leaving only five merchant stacks in this district. The differentials on silicon that were established during the Government's price fixing period are being adhered to. The average southern furnace price is now $25.50.

Cincinnati.—With several foundries closed due to strikes, there is little demand for foundry iron, but high silicon iron is better situated. The figure quoted chiefly is $26.75. Production is low and yard stocks are being depleted, factors which tend to a steadying up.

St. Louis.—There has been more inquiry and more actual business this week than at any time since the armistice. Prices are standing firm, only one case of shading being heard of.

SELECTED MARKET QUOTATIONS

Being a record of prices current on raw and finished material entering into the manufacture of mechanical and general engineering products.

PIG IRON

Grey forge, Pittsburgh	$27 15
Lake Superior, charcoal, Chicago	34 60
Standard low phos., Philadelphia	....
Bessemer, Pittsburgh	29 35
Basic, Valley furnace	25 75
Toronto price:—	
Silicon..2.25% to 2.75%	$32.75 to $35.75

IRON AND STEEL

Per lb. to Large Buyers	Cents
Iron bars, base, Toronto	$ 4 25
Steel bars, base, Toronto	4 25
Steel bars, 2 in. to 4 in. base	5 50
Steel bars, 4 in. and larger base	6 00
Iron bas, base, Montreal	3 75
Steel bars, base, Montreal	3 75
Reinforcing bars, base	4 50
Steel hoops	5 50
Norway iron	11 00
Tire steel	5 50
Spring steel	8 00
Brand steel, No. 10 gauge, base	4 40
Chequered floor plate, 3-16 in.	9 25
Chequered floor plate, ¼ in.	9 00
Staybolt iron	8 00
Bessemer rails, heavy, at mill	....
Steel bars, Pittsburgh	2 35
Tank plates, Pittsburgh	2 65
Structural shapes, Pittsburgh	2 45
Steel hoops, Pittsburgh	3 05
F.O.B., Toronto Warehouse	
Small shapes	4 50
F.O.B. Chicago Warehouse	
Steel bars	3 62
Structural shapes	3 72
Plates	3 90
Small shapes under 3″	3 62

FREIGHT RATES

Pittsburgh to Following Points	Per 100 lbs. C.L	L.C.L.
Montreal	33	45
St. John, N.B.	41½	55
Halifax	49	64½
Toronto	27	39
Guelph	27	39
London	27	39
Windsor	27	39
Winnipeg	89½	135

METALS

Lake copper	$19 50	$18 50
Electro copper	18 50	17 50
Castings, copper	18 50	17 00
Tin	58 00	55 00
Spelter	8 50	8 25
Lead	6 50	7 50
Antimony	9 00	8 50
Aluminum	38 00	35 00

Prices per 100 lbs.

PLATES

	Montreal	Toronto
Plates, ½ up	$ 5 00	$ 4 50
Plates, 3-16 in.	5 50	4 90

Price List No. 38

Standard Buttweld

	Per 100 feet	
⅛ in.	$ 6 00	$ 8 00
¼ in.	4 68	6 81
⅜ in.	4 68	6 81
½ in.	6 21	7 78
¾ in.	7 82	9 95
1 in.	11 56	14 71
1¼ in.	15 64	19 90
1½ in.	18 70	23 76
2 in.	25 16	32 01
2½ in.	40 37	51 19
3 in.	52 79	66 94
3½ in.	67 16	84 18
4 in.	79 57	99 74

Standard Lapweld

2 in.	38 81	35 34
2½ in.	42 12	52 36
3 in.	55 08	68 47
3½ in.	69 00	86 94
4 in.	81 75	103 00
4½ in.	93	1 18
5 in.	1 08	1 37
6 in.	1 40	1 78
7 in.	1 83	2 32
8I. in.	1 93	2 44
8 in.	2 22	2 81
9 in.	2 66	3 36
10L in.	2 46	3 12
10 in.	3 17	4 02

Terms 2% 30 days, approved credit.

Freight equalized on Chatham, Guelph, Hamilton, London, Montreal, Toronto, Welland.

Prices—Ontario, Quebec and Maritime Provinces.

WROUGHT NIPPLES

4″ and under, 45%.
4½″ and larger, 40%.
4″ and under, running thread, 25%.
Standard couplings, 4″ and under, 35%.
4½″ and larger, 15%.

OLD MATERIAL

Dealers' Buying Prices.

	Per 100 Pounds Montreal	Toronto
Copper, light	$11 50	$10 50
Copper, crucible	14 00	13 25
Copper, heavy	14 00	12 75
Copper wire	14 00	12 75
No. 1 machine composition	13 00	12 00
New brass cuttings	9 25	9 00
Red brass turnings	8 00	8 50
Yellow brass turnings	7 00	6 00
Light brass	5 00	5 00
Medium brass	7 00	6 00
Scrap zinc	5 00	5 00
Heavy lead	4 00	4 00
Tea lead	3 00	3 00
Aluminum	15 00	12 00
	Per Ton	
Heavy melting steel	9 50	9 00
Shell turnings	6 00	6 00
Boiler plate	11 00	8 00
Axles (wrought iron)	20 00	15 00
Rails	15 00	11 00
Malleable scrap	15 00	12 00
No. 1 machine cast iron	17 00	15 00
Pipe wrought	9 00	5 00
Car wheels	20-22	18 00
Steel axles	22 00	20 00
Mach. shop turnings	6 00	5 00
Stove plate	12 00	10 00
Cast boring	8 00	8 00

BOLTS, NUTS AND SCREWS

	Per Cent
Carriage bolts, ¾″ and less	35
Carriage bolts, 7-16 and up	15
Coach and lag screws	50
Stove bolts	65
Wrought washers	45
Elevator bolts	25
Machine bolts, 7-16 and over	25
Machine bolts, ⅜ and less	40
Blank bolts	25
Bolt ends	25
Machine screws, fl. and rd. hd., steel	27½
Machine screws, o. and fil. hd., steel	10
Machine screws, fl. and rd. hd., brass	net
Machine screws, o. and fil. hd brass	net
Nuts, square blank	add $0 75
Nuts, square, tapped	add 1 00
Nuts, hex., blank	add 1 00
Nuts, hex., tapped	add 1 25
Copper rivets and burrs, list plus	15
Burrs only, list plus	40
Iron rivets and burrs	40 and 5
Boiler rivets, base ¾″ and larger	$8 50
Structural rivets, as above	8 40
Wood screws, flat, bright	75
Wood screws, O. & R., bright	70
Wood screws, flat, brass	40
Wood screws, O. & R., brass	.5
Wood screws, flat, bronze	30
Wood screws, O. & R., bronze	27½

MILLED PRODUCTS

	Per Cent
Set screws	25
Sq. and Hex. Head Cap Screws	20
Rd. and Fil. Head Cap Screws	net
Flat But. Hd. Cap Screws	plue net
Fin. and Semi-fin. nuts up to 1 in.	25
Fin. and Semi-fin. nuts, over 1 in., up to 1½ in.	20
Fin. and Semi-fin. nuts over 1½ in., up to 2 in.	plus 10
Studs	net
Taper pins	40
Coupling bolts, plus	10
Planer head bolts, without fillet, list plus	10
Planer head bolts, with fillet, list plus 10 and	10
Planer head bolt nuts, same as finished nuts.	
Planer bolt washers	net
Hollow set screws	list plus 20
Collar screws	list plus 30, 10
Thumb screws	20
Thumb nuts	65
Patch bolts	add 40, 10
Cold pressed nuts to 1½ in.	add $4 50
Cold pressed nuts over 1½ in.	add 7 00

BILLETS

	Per Ton
Bessemer billets	$38 50
Open-hearth billets	38 50
O.H. sheet bars	42 00
Forging billets	51 00
Wire rods	52 00

Government prices.
F.O.B. Pittsburgh.

NAILS AND SPIKES

Wire nails	$4 70
Cut nails	4 75
Miscellaneous wire nails	60%
Spikes, ⅜ in. and larger	$7 50
Spikes, ¼ and 5-16 in.	8 00

ROPE AND PACKINGS

Drilling cables, Manila	0 39
Plumbers' oakum, per lb.	0 10
Packing, square braided	0 38
Packing, No. 1 Italian	0 44
Packing, No. 2 Italian	0 36
Pure Manila rope	0 37
British Manila rope	0 31
New Zealand hemp	0 31
Transmission rope, Manila	0 43
Cotton rope, ¼-lb. and up	0 74

POLISHED DRILL ROD

Discount off list, Montreal and Toronto	net

MISCELLANEOUS

Solder, strictly	$ 0 34
Solder, guaranteed	0 39
Babbitt metals	18 to 70
Soldering coppers, lb.	0 58
Lead wool, per lb.	0 14
Putty, 100-lb. drums	6 75
White lead, pure, cwt.	17 80
Red dry lead, 100-lb. kegs, per cwt.	15 50
Glue, English	0 35
Tarred slater's paper, roll	1 30
Gasoline, per gal., bulk	0 33
Benzine, per gal., bulk	0 32
Pure turpentine, single bbls., gal.	1 10
Linseed oil, raw, single bbls.	1 70
Linseed oil, boiled, single bbls.	1 73
Plaster Paris, per bbl.	4 50
Sandpaper, B. & A.	List plus 43
Emery cloth	List plus 37½
Sal Soda	0 03½
Sulphur, rolls	0 05
Sulphur, commercial	0 04½
Rosin "D," per lb.	0 07
Rosin "G," per lb.	0 08
Borax crystal and granular	0 14
Wood alcohol, per gallon	2 00
Whiting, plain, per 100 lbs.	2 50

CARBON DRILLS AND REAMERS

	Per Cent.
S.S. drills, wire sizes up to 52	35
S.S. drills, wire sizes, No. 53 to 80	40
Standard drills to 1½ in.	40
Standard drills, over 1½ in.	40
3-fluted drills, plus	10
Jobbers' and letter sizes	40
Bit stock	40
Ratchet drills	15
S.S. drills for wood	40
Wood boring brace drills	25
Electricians' bits	30
Sockets	40
Sleeves	40
Taper pin reamers	net
Drills and countersinks	list plus 40
Bridge reamers	50
Centre reamers	10
Chucking reamers	net
Hand reamers	10
High speed drills, list plus	75
High speed cutters, list plus	40

COLD ROLLED SHAFTING

At mill ..... list plus 5%
At warehouse ..... list plus 25%

Discounts off new list. Warehouse price at Montreal and Toronto

IRON PIPE FITTINGS

Malleable fittings, class A, 20% on list; class B and C, net list. Cast iron fittings, 15% off list. Malleable bushings, 25 and 7½%; cast bushings, 25%; unions, 45%; plugs, 20% off list. Net prices malleable fittings; class B black, 24½c lb.; class C black, 15¾c lb.; galvanized, class B, 34c lb.; class C, 24½c lb. F.O.B. Toronto.

SHEETS

	Montreal	Toronto
Sheets, black, No. 28	$ 6 55	$ 6 00
Sheets, black, No. 10	5 15	5 45
Canada plates, dull, 52 sheets	8 50	8 00
Can. plates, all bright	8 50	9 00
Apollo brand, 10¾ oz. galvanized	.....	.....
Queen's Head, 28 B.W.G.	.....	.....
Fleur-de-Lis, 28 B.W.G.	.....	.....
Gorbal's Best, No. 28	.....	.....
Colborne Crown, No. 28	.....	.....
Premier, No. 28 U.S.	.....	7 95
Premier, 10¾ oz.	.....	8 25
Zinc sheets	20 00	20 00

PROOF COIL CHAIN B

¼ in., $14.35; 5-16 in., $13.85; ⅜ in., $13.50; 7-16 in., $12.90; ½ in., $13.20; $13.00; ⅞ in., $12.90; 1 inch, $12.65; Extra for B.B. Chain, $1.20; Extra for B.B.B. Chain, $1.80.

ELECTRIC WELD COIL CHAIN B.B.

⅛ in., $13.00; 3-16 in., $12.50; ¼ in., $11.75; 5-16 in., $11.40; ⅜ in., $11.00; 7-16 in., $10.60; ½ in., $10.40; ⅝ in., $10.00; ¾ in., $9.90.

Prices per 100 lbs.

FILES AND RASPS

	Per Cent.
Globe	50
Vulcan	50
P.H. and Imperial	50
Nicholson	32½
Black Diamond	27½
J. Barton Smith, Eagle	50
McClelland, Globe	50
Delta Files	20
Disston	40
Whitman & Barnes	50
Great Western-American	50
Kearney & Foot, Arcade	50

BOILER TUBES.

Size	Seamless	Lapwelded
1 in.	$25 00	$.....
1¼ in.	27 00	.....
1½ in.	28 00	26 00
1¾ in.	30 00	26 00
2 in.	30 00	26 00
2¼ in.	33 00	28 00
2½ in.	40 00	32 00
3 in.	46 00	38 00
3¼ in.	.....	45 00
3½ in.	56 00	42 00
4 in.	70 00	54 00

Prices per 100 ft., Montreal and Toronto les 10.

OILS AND COMPOUNDS.

Castor oil, per lb.	.....
Royalite, per gal., bulk	19½
Palacine	22½
Machine oil, per gal.	27½
Black oil, per gal.	16
Cylinder oil, Capital	52
Cylinder oil, Acme	39½
Standard cutting compound, per lb.	0 06
Lard oil, per gal.	$2 60
Union thread cutting oil, antiseptic	88
Acme cutting oil, antiseptic	37½
Imperial quenching oil	39½
Petroleum fuel oil, bbls. net	10¼

BELTING—No 1 OAK TANNED

Extra heavy, single and double	30%
Standard	30, 10%
Cut leather lacing, No. 1	2 20
Leather in sides	1 75

TAPES

Chesterman Metallic, 50 ft.	$2 00
Lufkin Metallic, 603, 50 ft.	2 00
Admiral Steel Tape, 50 ft.	2 75
Admiral Steel Tape, 100 ft.	4 45
Major Jun. Steel Tape, 50 ft.	3 50
Rival Steel Tape, 50 ft.	2 75
Rival Steel Tape, 100 ft.	4 45
Reliable Jun. Steel Tape, 50 ft.	3 50

PLATING SUPPLIES

Polishing wheels, felt	3 25
Polishing wheels, bull-neck	2 00
Emery in kegs, American	07
Pumice, ground	3½ to 05
Emery glue	28 to 30
Tripoli composition	06 to 09
Crocus composition	08 to 10
Emery composition	08 to 09
Rouge, silver	35 to 50
Rouge, powder	30 to 45

Prices per lb.

ARTIFICIAL CORUNDUM

Grits, 6 to 70 inclusive	.08½
Grits, 80 and finer	.06

BRASS

Brass rods, base ½ in. to 1 in. rod	0 30
Brass sheets, 24 gauge and heavier, base	$0 38

WASTE

Brass tubing, seamless	0 46
Copper tubing, seamless	0 48

XXX Extra	19½	Atlas	17
Peerless	19	X Empire	15½
Grand	18	Ideal	16
Superior	18	X Press	14
X L C R	17		

Colored

Lion	15	Popular	12
Standard	13½	Keen	10½
No. 1	13½		

Wool Packing

Arrow	25	Anvil	15
Axle	20	Anchor	11

Washed Wipers

Select White	11	Dark colored	09
Mixed colored	10		

This list subject to trade discount for quantity.

RUBBER BELTING

Standard ... 10% Best grades ... 15%

ANODES

Nickel	.58 to .65
Copper	.38 to .45
Tin	.70 to .70
Zinc	.18 to .18

Prices per lb.

COPPER PRODUCTS.

	Montreal	Toronto
Bars, ½ to 2 in.	$42 50	$43 00
Copper wire, list plus 10		
Plain sheets, 14 oz., 14x60 in.	46 00	44 00
Copper sheet, tinned, 14x60, 14 oz.	48 00	48 00
Copper sheet, planished, 16 oz. base	46 00	45 00
Braziers', in sheets, 6 x 4 base	45 00	44 00

LEAD SHEETS.

	Montreal	Toronto
Sheets, 3 lbs. sq. ft.	$10 25	$11 50
Sheets, 3½ lbs. sq. ft.	10 00	11 00
Sheets, 4 to 6 lbs. sq. ft.	9 75	10 50

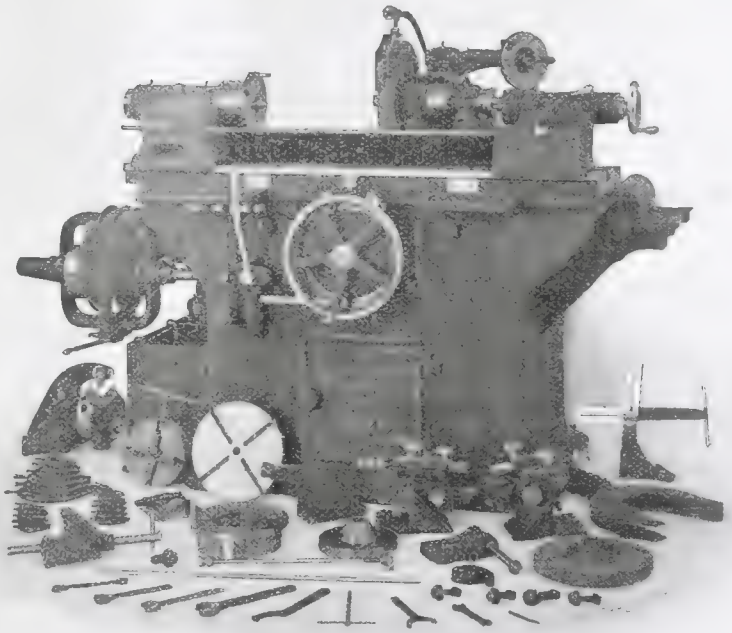
Cut sheets, ½c per lb. extra.
Cut sheets to size, 1c per lb. extra.

PLATING CHEMICALS.

Acid, boracic	$ .25
Acid, hydrochloric	.06
Acid, nitric	.14
Acid, sulphuric	.06
Ammonia, aqua	.23
Ammonium carbonate	-
Ammonium, chloride	.55
Ammonium hydrosulphuret	.30
Ammonium sulphate	.15
Arsenic, white	.27
Copper, carbonate, annhy	.50
Copper, sulphate	.22
Cobalt, sulphate	.20
Iron perchloride	.40
Lead acetate	.35
Nickel ammonium sulphate	.25
Nickel carbonate	.32
Nickel sulphate	.35
Potassium carbonate	1.80
Potassium sulphide (substitute)	2 25
Silver chloride (per oz.)	1.45
Silver nitrate (per oz.)	1.20
Sodium bisulphite	.15
Sodium carbonate crystals	.05
Sodium cyanide, 127-130%	.40
Sodium hydrate	.22
Sodium hyposulphite, per 100 lbs.	6.00
Sodium phosphate	.18
Tin chloride	1.75
Zinc chloride, C.P.	.80
Zinc sulphate	.15

Prices per lb. unless otherwise stated.

Landis Grinders for Production



No. 1 UNIVERSAL

Capacity 10" x 20"
will do all kinds of
INTERNAL and EXTERNAL
CYLINDRICAL (Straight and taper)
and CUTTER GRINDING

It has many special features giving CONVENIENCE, ACCURACY and PRODUCTION.

Write for bulletin giving detailed description and prices. IN STOCK for immediate shipment.

"IF IT'S MACHINERY WRITE WILLIAMS"

THE A. R. WILLIAMS MACHINERY CO., Ltd.
64 FRONT ST. WEST TORONTO
MONTREAL ST. JOHN, N.B. WINNIPEG VANCOUVER HALIFAX BUFFALO, N.Y.

Acid Electric STEEL CASTINGS

Acid Electric Steel Castings show superior ability to resist wear and crystallization. They are smooth in texture, free from Blow Holes, and machine perfectly. We specialize in

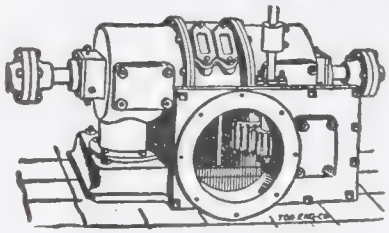
Railroad and Other High Grade Castings

up to 15 tons, any specification. Electric Steel Castings COST NO MORE than ordinary Steel Castings.

Prices on Application—Prompt Deliveries

The Thos. Davidson Mfg. Co., Limited
Steel Foundry Division, Lachine Canal
Head Office: 187 Delisle St. MONTREAL
Phone Victoria 1492

WATER POWER DEVELOPMENT



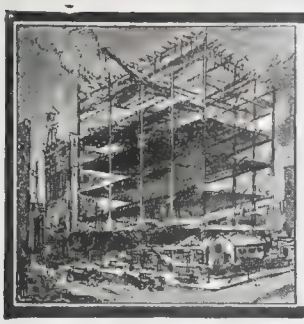
Over forty years' experience in designing and installing special turbines, both on vertical and horizontal shafts.

Can supply complete equipment, including flume, turbine and power transmission.

Stock of standard vertical shaft Little Giant Turbines on hand for prompt shipment.

We solicit your inquiries.

J. C. WILSON & CO.
BELLEVILLE, ONTARIO



INDUSTRIAL NEWS

NEW SHOPS, TENDERS AND CONTRACTS
PERSONAL AND TRADE NOTES

MACHINES SOLD AT SMALL FIGURE

St. Thomas Sale Bidding Did Not Drive the Prices Up Very High

Special to CANADIAN MACHINERY.

St. Thomas, May 28.—Although a good crowd of enthusiastic buyers were on hand, an auctioneer with a rapid fire talk that would be hard to equal, and buying was comparatively brisk, the $9,000 worth of munition machinery, including some of the finest lathes in use at the J. D. Cummings, Elgin Manufacturing plant, sold for less than half their value. The great difference between the sale price and the original price is said to be caused by the signing of the armistice. Mr. Cummings installed his equipment only a few months prior to the cessation of hostilities, and consequently the loss is even greater.

The buyers present included the following: J. E. Armstrong, Fletcher; H. M. Black, Toronto; R. C. Eckert, J. Harris, T. Knowles, Yates Machinery and Supply Company of London; Frankel Brothers, J. Griffin and N. Smith, of Toronto; Hall and Quick, Hamilton; H. Jackson, St. Thomas; W. H. Kennedy, Ailsa Craig; Maxwell's, Limited, St. Marys; M. D. Prendergast, Sarnia; Hugh Park Foundry, Oshawa; and the Thompson Automobile Company, of Windsor.

An evidence of some of the low prices bid for brand new machinery is shown in the following quotations, which were obtained at the close of the sale held in St. Thomas this week:

A. Jones and Lamson, turret lathe, 3 in. by 36 in., complete with chuck, countershaft and tooling, valued at $1,-50, sold for $400; Beaman and Smith combined engine and turret lathe, valued at $900, brought $325; a Martin turret lathe valued at $700 sold for $55; South Bend lathes, double back-geared, in use only one weeg, and valued at $716 each, sold for $475; a 75 h.p. Crocker-Wheeler squirrel cage induction motor, used but one week, and valued at $1,375, sold for $700.

Prices continued throughout the sale in this way, the smallest priced article was a 24-foot dust collector, which sold for 25c. Three air cylinders, only used a short time, and invoiced at $1,300, sold for the magnificent price of $50.

Mr. Cummings, who managed the Elgin Company here for some time, held a similar sale in London this week.

TRADE GOSSIP

Tillsonburg Helps Industries.—The Tillsonburg Shoe Company has had $25,-000 bonds guaranteed by the city, and the company will spend $35,000 on a new plant, and increase the number of employees from 105 to 150 or 175.

France Withdraws Restrictions.—All restrictions imposed during the war on American goods have now been withdrawn, according to a statement by Louis Loucheur, the French Minister of Trade. All remaining restrictions of all character are lifted by this pronouncement.

Ottawa Valley Lumber Sold.—It is stated that all of the lumber in the Ottawa Valley suitable for export has been sold, and great efforts will be made to ship it. The British Government has bought altogether about 700,000,000 feet, which is divided between British Columbia and the Ottawa Valley.

Going to Hensall.—The Jackson Mfg. Co., of Zurich and Goderich, is about to establish a branch in Hensall. The agreement between the town and the company is being referred to the people in the form of a by-law, and if ratified the company will begin operations immediately. It is found impossible in Clinton to get the necessary help to develop as fast as the firm would wish to.

Trade Decrease.—A decrease in trade for the first month of the new fiscal year amounting to $29,244,403, is shown by the figures just issued. The total for April, 1919, was $121,527,952, as compared with $150,772,355 in April, 1918. The decrease was chiefly in importations, which declined $24,368,720 as compared with the corresponding period of last year.

Express Company Change Hours.—The Express Traffic Association of Canada announces the adoption of an eight hour day, and a consequent change in delivery hours. From June 1 collections by the companies will be made between 8 a.m. and 5 p.m. Depot offices, where night staffs are maintained, will be open for delivery to consignees calling for parcels, and to receive shipments after the last collection has been made.

New Engineering Company.—The Engineering Corporation, Ltd., Vancouver, B.C., has been organized by Messrs. DuCane, Dutcher & Co. The directors

PLANT OF BRITISH FORGINGS HAS NOT BEEN DISPOSED OF TO DATE

NEGOTIATIONS have been carried on for some time past between Baldwins, Limited, the Imperial Munitions Board and the Harbor Commissioners relative to the purchase of the plant of the British Forgings at Toronto.

Baldwins, Ltd., will establish a large tin plate mill in Toronto if the negotiations come to a satisfactory conclusion and would use the electric furnace equipment of the present plant in the making of the steel ingots for tin plate.

The plant of the British Forgings, Ltd., Toronto, which is the largest electric furnace plant in the world, was erected in the spring of 1917 by the Imperial Munitions Board for the manufacture of shell forgings for the British and Allied Governments. The electric steel furnace offered the best means of utilizing the steel scrap, which had been accumulating in Canada through the manufacture of munitions and, accordingly, ten six-ton furnaces of the Heroult type were installed with a capacity of almost 350 tons per day. These furnaces each used, while running, approximately 1,500 kilowatts of electrical energy, and the whole plant, if running to capacity, would draw about 20,000 horse power from the distribution system of the Hydro.

This load necessitated the construction of an underground duct through the down-town district of Toronto, about three miles in length.

All the steps from the steel scrap to the finished forging ready for machinery were carried out at this plant, the scrap being furnaced, cast into ingots and the ingots forged.

The plant had a capacity of about 450 tons of steel per day if run at full capacity, and a production of 12,-000 six-in. shell forgings was reached for a 24-hour shift at one time on the presses.

The present furnace plant would be adaptable to the manufacture of tin-plate with few changes, so far as the electric plant itself is concerned, but considerable additions would be required for the rolling and dipping of the plate. A rolling mill would be necessary, and some of the present buildings, formerly used for shell forgings, etc., could be used for housing and additional equipment necessary.

GEOMETRIC

SELF OPENING DIE HEAD

Specify Them for

– accuracy " "
– clean cut threads
– fast production
– long life " " "

The Geometric Tool Company
New Haven, Conn.

Canadian Agents:

Williams & Wilson, Ltd., Montreal; The A. R. Williams Machinery Co., Ltd., Toronto, Winnipeg and St. John, N.B.

are Howard K. Dutcher, Jasper S. Connell and Major Geo. A. Walker, R.E. The new corporation will undertake general engineering and construction work, and will also handle engineering materials and equipment in connection with local and foreign business, as purchasing agents.

Brockville Buys Factory Sites.—The Brockville Board of Trade, at a general meeting, authorized the purchase of twenty-four acres of land for factory sites, within the corporation limits. Industrial expansion is booming in Brockville just now, as a result of the introduction of Hydro-Electric power. Negotiations are being carried on between the city and a number of American manufacturers with a view to establishing new industries in the city.

New Sand Deposits.—Hyde and Sons, of 43 Common Street, Montreal, have recently acquired the sole selling rights of the Brockville sand development. This sand has been thoroughly examined and tested both at the deposits and under actual conditions in the foundries, and results have shown it to be a high-grade quality of sand. It is the intention of Hyde and Sons to share the sale of this sand with other Canadian supply houses, so that every possible opportunity will be given for the more extensive use of this Canadian sand.

Future For Douglas Fir.—Sir James Ball, the British Lumber Commissioner, at a luncheon in Victoria, predicted a great future for Douglas fir. Sir James believes that it will eventually replace American yellow pine in the British market. If British Columbia firms had pressed its claims as they should have done, it would have won its place ere this. There are immense possibilities for the development of this class of business on Vancouver Island and the mainland. Seattle has just received, through one of its lumber firms, an order for 191,000,000 feet of Douglas fir, which is referred to as one of a series of contracts for reconstruction work in the devastated areas.

Angus Shops Busy.—The Canadian Pacific Railway Company's Angus shops are building ten of the heavy Mikado type freight locomotive. They are being built under the direct supervision of Mr. W. H. Winterrowd, the chief mechanical engineer. The engine and tender in working condition weigh 500,000 lbs. The driving wheels are 63 inches in diameter. Cylinders are 25½ inches diameter by 32 inch stroke, the working pressure being 200 lbs. per square inch. They have a tractive effort of 36,000 lbs. The tender has a capacity of 12 tons of coal, and 8,000 Imperial gallons of water.

New Railway Incorporations.—A line between Baker Lake to Schultz Lake and to Old Fort Reliance, on the Great Slave Lake, about 100 miles altogether, is to be built by a new company under the title of "The Northwest Route, Ltd. The company is English with headquarters in London, and the capital stock is $1,000,000. There is said to be oil in the district. In view of the difficulty of getting materials and supplies to the spot the House Committee reduced the mileage obligatory on new railways from 25 miles in the first two years to ten miles. The bill to incorporate the Athabasca and Grand Prairie Railway Co. was also reported by the Committee. The object of this company is coal, said to be "near anthracite" and equal to the average Pennsylvania grade. The route will be from Brule Lake to the junction of Smoky River, a distance of 60 miles. Montreal capital is behind the project.

Empire Trade Development.—One of the biggest tasks ahead of the Empire in connection with reconstruction is the work of organizing the supply of information on the thousands of matters of importance of the Empire's trade and business that will have to be promptly dealt with. There are, of course, many official sources of which every advantage should be taken, but, in particular, there is the Information Bureau of the Royal Colonial Institute, which has been established for many years and which possesses sources of information that are not available in any other organization. The service provided by this Bureau is not only at the disposal of fellows and associates of the Royal Colonial Institute, but may be made use of by British subjects in any part of the Empire. The Institute, through its Trade and Industry Committee, seeks to promote the economic development of the British Empire and to this end welcomes enquiries on openings for trade and industrial activity not only in respect to manufactured articles, but also raw materials, foodstuffs and transportation and inter-communication facilities. Enquiries should be addressed to the secretary, Trade and Industry Committee, Royal Colonial Institute, Northumberland Avenue, London, England.

New Patents.—The following is a list of Canadian patents recently issued through the agency of Messrs. Ridout & Maybee, 59 Yonge street, Toronto, from whom further particulars may be obtained: Richard P. Park, machines for reducing ore; Dodd Heating Systems, Limited, automatic valve; Wm. J. Lefever, ballast trimmers for railway rtacks; Harold W. E. Josling, means for promoting circulation of the fluids in steam generations; Alfred H. Anthony, automatic regulators for boiler feed apparatus; Alfred H. Anthony, float operated water level regulators and the like; Alfred H. Anthony, float operated valves; Donald S. McNeill, dooks, holdfasts and foundation pins; William Wilkie, machines for pressing the seams and edges of the cloth of various parts of wearing apparel during process of manufacture; Aaron N. Warfield, metal car; Wm. T. Stephens, process of producing iron and steel; Francis W. Washburn, gate; Geo. W. Berry, hingeing of sheet metal receptacles; Emile Brooks & Kiro Roberts, pianoforte actions; Henry W. Crowe, the manufacture of cheese or cheeselike food products; Minerals Separation North American Corporation, apparatus for the concentration of sulphide ores; Thos. W. S. Hutchins, muffle furnace; Llewelyn M. Rees, weather strips.

SHORTER HOURS AND MORE WAGES WOULD NOT SOLVE PROBLEM

(Special to Canadian Machinery)

LONDON, May 27.—That there is but little unrest among the employees of the various manufacturing industries was brought out by the evidence taken by the Industrial Relations Commission, which met in London, on May 20. The commission was composed of the following members: Chief Justice Mathers, chairman; Hon. Smeaton White, Carl Riordon, Charles Harrison, M.P. for Nipissing; Tom Moore, president of the Dominion Trades Congress, and J. W. Bruce.

Lieut.-Col. W. M. Gartshore, vice-president of the McClary Mfg. Co., and E. G. Henderson, of Windsor, were the only large employers of labor who gave evidence at the hearing.

Mr. Arthur W. White, vice-president and general manager of George White & Sons Co., was present, but he stated that he did not care to be heard at the session at all.

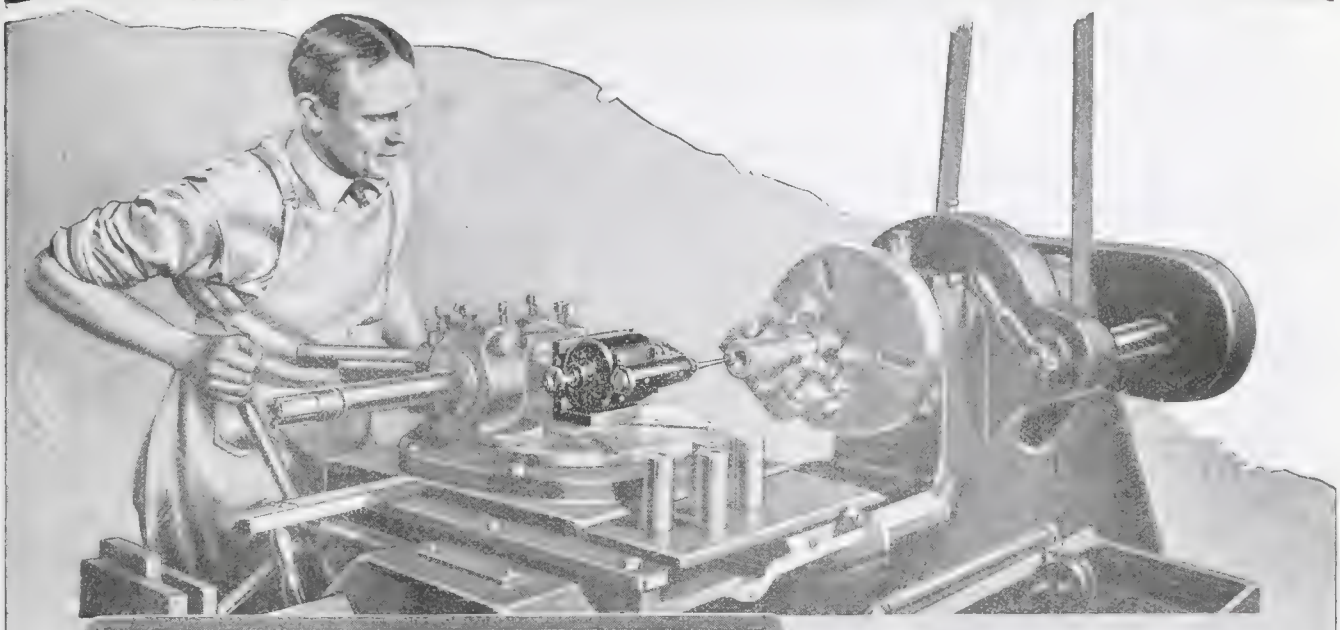
In an interview Mr. White said that "The unrest in Canada is very largely attributable to Bolshevist propaganda spread about, not by organized labor, but by foreign industrial or incendiary socialists.

Continuing, in reference to the Industrial Relations Commission, Mr. White said:

"The evidence taken before the Royal Commission on industrial relations should assist the Government in arriving at just conclusions. While there was some evidence of sane employers and employees, which pointed out that cooperation and common sense would correct the present evils, most of the evidence taken consisted largely of pet theories of men of revolutionary and Bolshevik minds, and the more weird theories of socialistic cranks. It is to be hoped that the Commission, in its wisdom, will sift out the evidence of sane men, and that the report will be instrumental in establishing satisfactory relations between employer and employee.

"The preponderance of evidence before the Commission is toward shorter hours and higher wages. Under the present conditions this would only aggravate matters. What Canada needs is not less production and higher cost of living, which would be the outcome of shorter hours and higher wages, but greater production per capita, which can only be accomplished by everyone "digging in" and doing their best.

It would be unwise at the present



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STARTING and finishing this job with one set-up—from machining the casting to grinding the hardened bearing in place—is a good illustration of the **DUMORE** grinder on production. This method positively aligns each bearing with the rest of the machining, by tempering. And the danger of chatter-marks, taper or bell-mouth is eliminated because the **DUMORE** grinder is perfectly balanced throughout and gives correct cutting speeds to even small emery wheels. Limits of .0001" are easily maintained.

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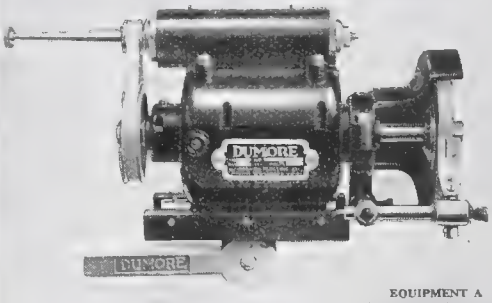
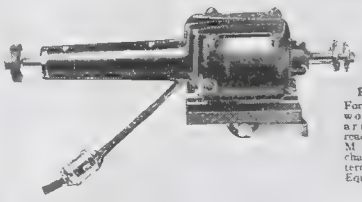
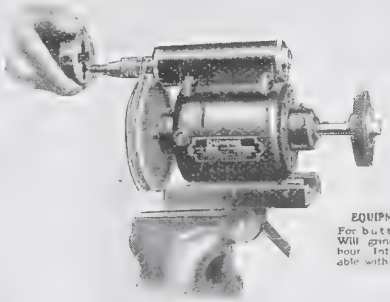


EQUIPMENT A
For general tool room use. Includes High Speed Internal Spindle A with reach of 3 inches 10,000 R P M Comes fully equipped. Weighs 171 pounds.



EQUIPMENT B
For deep internal work. Extension arm has 19-inch reach. 10,000 R.P.M. Arm interchangeable with internal spindle on Equipment A.



EQUIPMENT C
For button dies Will grind 20 an hour Interchangeable with A and B

DUMORE HIGH SPEED GRINDERS

time to make any sweeping changes in the tariff, or any other legislation that would tend toward reduced efforts on the part of the industries, the miners, the lumbermen or the farmers. What we need is work for everyone, and everyone willing to work. Patience and courage, and co-operation between employers and employees. Patience and courage for legislators to meet conditions as they arise, and not jump at the beck and call of any section of the country to abolish tariffs, unless it is for the betterment of the whole of Canada, and to make jobs for returned soldiers.

Co-operation throughout Canada is absolutely necessary to overcome the present state of unrest. All must feel that one is dependent upon the other. The law of interdependence is more clearly shown in Canada at the present time than ever before in the history of the world, national interdependence, provincial interdependence, interdependence of employer and employee. There is no room for class legislation or class distinction. We must have leaders with vision. There is no room for the employer who cries, as the Financial Post puts it, "To hell with the trade unions," or the socialist whe spreads revolutionary propaganda. Either means disaster.

The motto of all should be: "Co-operation, courage, patience and production."

SHEFFIELD MACHINE TOOL PLANTS PLAN TO GO AFTER CANADIAN TRADE

(From our London, Eng., office.)

IT is a common thing in Sheffield today to find works managers who will tell you that during the war their works have been extended to five or six times their original size, and that their output has more than trebled since August, 1914. Consequent upon the termination of hostilities the cessation of munition contracts has given rise to the big problem of changing over from wartime to peace work, and the diversion of augmented energies into other channels.

If trade is allowed to shrink back to normal proportions it will be faced with enormous losses in the shape of derelict plant, and a general lockout of labor would be precipitated. The absence for the time being, at any rate, of German competition has produced a big boom and a glut of foreign orders. But manufacturers are taking the long view, and with an eye to future business are ready to cultivate the asset offered by the Dominion markets as an alternative and more lasting solution to the question of finding a profitable field to absorb their magnified output. In discussing export and overseas markets Canada is spoken of freely as a promising field for steel products.

Aid of Intensive Production

By the help of intensive production it is hoped to successfully compete in Dominion markets, and at the same time to meet the increase in cost of British steel, due to the removal of the Government war subsidy, and likewise to neutralize the upward course of the workers' wages.

Firm's New Lines

Figuring prominently amongst the new lines which are to be turned out on an intensive scale are engineer's tools in high speed steel, machine tools, milling cutters, reamers, lathes, grinding machines, and a wide variety of small tools of the highest quality at competitive prices.

Great strides have been made in the employment of stampings. Parts of all kinds are now being accurately stamped out with the result that the amount of subsequent machining necessary is reduced to a minimum. Standardization is also being rapidly adopted, and there is, moreover, a drastic curtailment in the number of patterns being turned out.

Conditions Generally Unsettled

Manufacturers are still rather shy of giving away information as to their plans for the development of their overseas trade, but signs are not wanting that some firms are already negotiating for Canadian business. Two firms specializing in patent steels have already commenced operations, and a host of minor concerns are seeking agents. The reply to enquiries generally takes the form of some statement as to conditions being too unsettled at present to give an opinion. An outstanding feature of Sheffield re-organization is the number of amalgamations and working agreements which are being concluded by firms in the same way of business.

Sheffield Trade Exhibition

Another sign of the times if the formation of a city development committee under the aegis of the municipality. This body has for its objects the promotion of trade, industry, development and general prosperity of the city, its manufacturers, traders and inhabitants. It also exhibits a lively interest in the possibilities of overseas markets, and has the backing of many of the biggest firms. Quite recently it placed before the manufacturers of Sheffield a proposal for holding an industrial exhibition, the main object of which would be to demonstrate the wide range of the city's products in peace and war. The idea is hailed as affording a good opportunity for introducing Sheffield to a wider world area of potential buyers.

PERSONAL

The directors of the Armstrong, Whitworth Co. of Canada, have recently made the following promotions in connection with the operating staff: Lawrence Russel has been appointed general manager; Herbert Johnson, formerly general superintendent of the works at Longueuil, has been promoted to the position of assistant general manager; W. T. Townsend has been made general superintendent of the plant, and G. E. Odell has been appointed chief accountant.

Mr. James T. Mathews, vice-president of the Mathews Steamship Co., the oldest steamship firm on the lakes, passed away at his residence in Toronto recently. Mr. Mathews was in his seventieth year, and was born at Niagara on the lake. He organized, with his father, the firm of J, & J. Mathews, commencing business with one schooner, the Heather Bell. The fleet has since owned twenty-six vessels. When his father died in 1900 Mr. Mathews and his brother, A. E. Mathews, organized the Mathews Steamship Co.

TENDERS

The Department of Public Works is calling for tenders, which will be received up to noon on June 12, for the delivery and placing of stone on portions of the seaward side of the Souris breakwater, Kings County, P.E.I.

The Town of Trenton will receive tenders up to June 10, for the erection of a four-room addition to a public school. Plans and specifications can be seen at the architect's office, S. B. Coon & Son, Excelsior Life Building, Toronto St., Toronto.

St. Catharines Public School Board ask for tenders for the erection and completion of two one-story school buildings. Plans and specifications can be seen at the office of the McLean Daily Reports, Ltd., Toronto, and at the office of A. E. Nicholson, architect, St. Catharines.

The Department of Railways and Canals is calling for tenders for rebuilding lower entrance pier, lock No. 25, Galops Canal. An accepted cheque for $1,500 must accompany each tender, made payable to the Minister of Railways and Canals. Plans and specifications can be seen at the office of the chief engineer of the department, Ottawa, and at the office of the superintending engineer, Ontario and St. Lawrence Canals, Cornwall, Ont.

MARINE

Weymouth, N. S. —The three topmast schooner "Marine" was launched here recently for Messrs. Beasley Bros., Halifax. She is a vessel of 4,501 tons net, and is the finest schooner launched in Digby County since the boom in shipbuilding came in. The boss builder was Augustus Gaudet, of White Cove.

Port Huron.—A collision took place near Algonac, between the lake freighter "John B. Cowie" and the steamer "Byers" at Russell's Island, resulting in the sinking of the former vessel. The "Byers," although badly damaged, took off the crew of the "John B. Cowie," and proceeded to Port Huron under her own steam.

Detroit.—Local shipbuilders are busy turning out oil burning freighters for the U. S. shipping Board. They are of the same size as the coal burning ships,

Nichrome Castings for Heat Treatment

THE ADVANTAGES OF NICHROME CASTINGS

Cast Nichrome is used in many cases where cast iron has proved incapable. The durability of Nichrome Castings was recognized by the Government early in the war, and found indispensable in the production of gas-mask charcoal.

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Cast Nichrome is strong and tough with a tensile strength of 24500 lb. per sq. in. at a temperature of 1800 degrees Fahrenheit.

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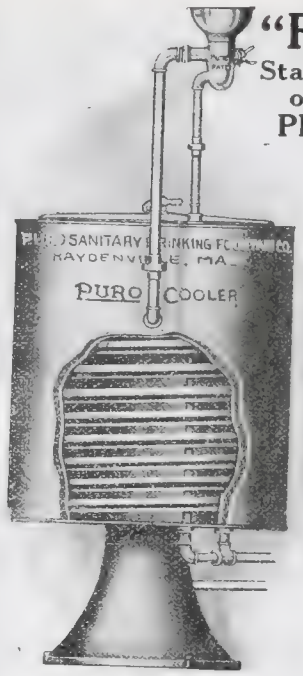
THE "FLU" Stayed out of this PLANT



PURO SANITARY DRINKING FOUNTAIN

(MADE IN CANADA)

The only fountain with a bowl that prevents lips touching the bubbler paid its moderate cost over and over in all those well-ordered plants whose precautionary measures successfully barred the Spanish Influenza. PURO saves lives, time and water. **Write**

Puro Sanitary Drinking Fountain Co.

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but will be able to carry more cargo, owing to the absence of bunkers. The first one will be ready to go down to the sea about June 1.

Toronto.—The new life boat for Toronto harbor was tested recently by Commanders Radcliffe and Phillips of the Department of Naval Service, and found satisfactory in every respect. She attained a speed of eight knots, and her self-righting and buoyancy tests were perfectly good. This is the first boat of her kind built in Canada.

Quebec.—A collision, resulting in damage to both vessels concerned, took place in the St. Lawrence, about forty miles below Quebec recently. The ships concerned were the C.P.R. freighter "War Merrill," bound from Montreal to England, and dredge No. 8. The vessels struck head on, and sustained severe damage to their bows.

Sarnia.—The Imperial Oil Company's steamer "Royalite" has gone ashore on Belle Isle while en route for Toronto with a cargo of oil. The vessel is reported undamaged and the Canadian Oil Co. steamer "W. S. Calvert," unloading at Froomfield, has been sent to take part of the Royalite's cargo from her, in the hope that she will then float.

Montreal.—With the sailing of the "Canadian Pioneer" from the port of Montreal to the port of Buenos Aires, with 8,500 tons of general cargo, the actual commencement of the Canadian Government Merchant Service was inaugurated. On the return trip the "Pioneer" will bring back from the South American port a general cargo of tropical products.

Ottawa.—The Federal Government has decided to take over the harbor of St. John, and a bill will be introduced in Parliament this session to enable it to do so. The details have been settled between the members for St. John and the Minister of Marine, Hon. C. C. Ballantyne. It is understood that the compensation to be allowed the city of St. John for their investment will be in the neighborhood of $2,225,000.

Alpena, Mich.—Following a collision with the steamer Quincy A. Shaw, of the M. A. Hanna Co., the steamer D. R. Hanna sank in 141 feet of water eleven miles east of Thunder Bay Island. The Hanna, which was owned by the Pioneer Steamship Co. of Cleveland, was valued at $1,000,000, and her cargo of wheat at over $800,000. She capsized before she sank, and this fact will make raising her a difficult if not an impossible feat. She was 552 feet long and 66 feet beam, and was built in 1906 in Lorain.

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Ottawa.—Mr. Joseph Wilson, of the Department of Naval Service, giving evidence before the Public Accounts Committee of the House of Commons, spoke of the contracts given the Canadian Vickers for trawlers. These were for six trawlers, to be built at Montreal and Kingston, and the contract was based on 6 per cent. of the cost of labor to cover overhead, plus 10 per cent. on the total, including materials. This meant a profit of about $15,000 on each vessel, which the witness thought was quite reasonable.

London, Eng.—Mr. Bosworth, of the Canadian Pacific ocean services, in a recent interview, spoke about the handicap they were under due to the control exercised by the Government over cargo space. There is at the present time 70 per cent. of the cargo space under control, but in June it will drop to 50 per cent. This naturally prevents the C.P.O.S. from taking all the business offering. The line had resumed their service from Antwerp, and would shortly be sending ships to Rotterdam, but no new services would be undertaken, until the line could properly serve the old trades.

Victoria, B. C.—The Foundation Co. has launched its fiftieth ship from its Pacific coast yards. The name of the vessel launched was the "Montcalm," and the event passed off very successfully. As soon as the vessel had left the ways and had been checked up, the sponsor was presented with a gold vanity case, on which was engraved, "From the Montcalm to her sponsor." The vessels launched up to date from the various yards of the Foundation Co. comprise forty 3,000 ton wooden auxiliary schooners for the French Government, built at the Portland and Tacoma yards, the last of which were launched last December; five 2,500-ton wooden vessels for the Imperial Munitions Board in Victoria, and five vessels of 3,000 tons, wood, for the French Government, part of a contract of twenty.

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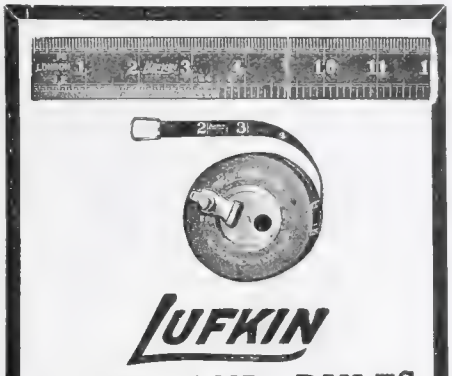
For All
Machinists' Supplies



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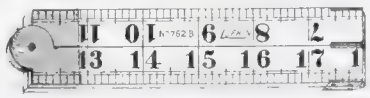

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We are manufacturers of stamped parts for other manufacturers.

We do any kind of sheet metal stamping that you require. Our improved presses and plating plant enable us to produce the finest quality of work in a surprisingly short time.

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INCORPORATIONS

A new motor company on a large scale is announced, to be known as General Motors of Canada, Ltd., with an authorized capital of $10,000,000. This will be related to the great General Motors Corporation of the United States. Mr. R. S. McLaughlin, president of the McLaughlin Motor Car Co., Oshawa, has been elected the president of this new concern. Mr. McLaughlin was recently re-elected a director of the General Motors Corporation—a three-hundred-million-dollar corporation in the United States. He is also vice-president of the same concern and a member of the Executive Committee. As president of General Motors of Canada, Ltd., Mr. McLaughlin will have charge of the Canadian business of this mammoth corporation.

Temporary Slack at Shipyard

The first slack period that has occurred for three and a half years was reported at the Esquimalt shipbuilding yards of the Yarrows Company recently. With the exception of repair work on four whalers there was no work in progress. This condition of affairs will be of brief duration, however, as there is considerable work in sight. It has been intimated that repair work in connection with vessels that were hurriedly built during the last two years will furnish some activity at the shipbuilding yards during the coming months.

Close Concrete Shipyard

The Ferro-Concrete Ship Construction Company will shortly cease operations at their shipbuilding yard at Barrow, England. The launching ways are being removed, and the concrete plant and materials are to be sold. So far four craft of this type have been built. These include three barges and an ocean-going steamer named the Armistice, which has made several coastwise trips. Two of the barges are now in the Devonshire Dock, Barrow. These four craft were built for the State, and it is stated that no further orders for this class of work will be given out by the Government. The company was formed in 1917 to fulfil the urgent demands for all kinds of craft. Hopes are entertained of a new shipbuilding industry in steel ships on the same site.

Lead Consumption in Canada

The net consumption of lead in Canada during the five years 1910-14 averaged 31,000 tons a year, and increased in 1915 to 46,000 tons. There is, therefore, ample scope for the extension of lead mining in Canada before even the normal home requirements are completely met. Lead production in British Columbia is growing rapidly, and is certain to increase; the ore is derived chiefly from the Slocan and Fort Steele mining divisions.

New Toronto Plant

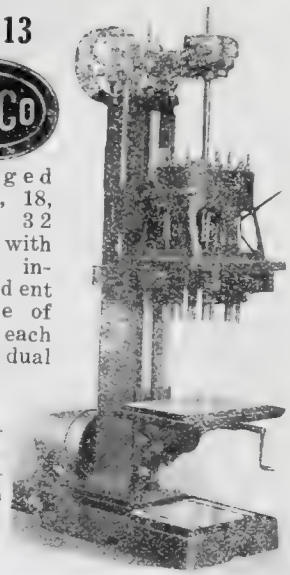
A permit has been taken out by William Neilson, Limited, for the erection of a $250,000 plant at 277 Gladstone avenue. The structure will be five storeys in height. Excavating work has already been commenced.

No. 13

NATCO

Arranged with 16, 18, 24 or 32 spindles, with patented independent change of speed to each individual drill.

Let us give you a production estimate on your work



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Wants Dairy Machinery

Dairying machinery of all kinds is needed in Jamaica, according to consular advices from that island. Sweden has been trying to secure the largest part of the trade, and United States firms are now being urged to secure business there. Direct shipping connection with the British West Indies should enable Canadian manufacturers to enlarge the trade relations with these British possessions.

Oil Industry Equipment

Materials are required in the Island of Trinidad in the British West Indies that indicate the intention of oil men to explore the petroleum resources of that territory. All kinds of equipment in connection with the oil industry are in demand. Drums, tanks, tools of all kinds, and a large quantity of ten-inch casing are needed by different companies in the island.

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If you have a lathe
a drill
a milling machine
a planer
a chain block
a chuck
a motor
a crane
a stock of belting
an engine
a compressor
or any other machine shop equipment for which you really have no further use, why not turn it into *cash?*

Someone may be looking for just the machine you may want to sell. Let us bring you together.

A "classified" ad. in CANADIAN MACHINERY, costing a few cents per issue, has done wonders for others. Why not try it?

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THIS illustration shows an operator repairing a leaky tank car right on the track at a trifling expense, by the Prest-O-Lite process of Oxy-Acetylene Welding. Thousands of railroads, mines, factories and machine shops have adopted this process, and are saving hundreds of thousands of dollars annually.

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Prest-O-Lite PROCESS

employs both gases (acetylene and oxygen) in portable cylinders. Prest-O-Lite Dissolved Acetylene is backed by Prest-O-Lite service, which insures prompt exchange of full cylinders for empty ones. Provides dry, purified gas, insuring better welds, quicker work and lower operating cost.

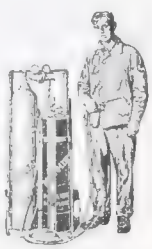
Apparatus consists of an equal pressure blow pipe, automatic regulators and gauges, and all necessary equipment. Adaptable for oxy-acetylene cutting by the addition of special cutting blow pipe.

Thorough instructions are furnished free to every user of Prest-O-Lite Dissolved Acetylene. Any average workman who understands metals can learn the welding process quickly and easily.

We will gladly send illustrated literature and interesting data showing actual instances of savings made by others. It may suggest valuable ideas to you. Write for it. Address Department C-107.

Prest-O-Lite Company of Canada, Limited
PREST-O-LITE BUILDING
Corner Elm St. and Centre Ave.
TORONTO

Plants at: Toronto, Ont., Merritton, Ont. Shawinigan Falls, P.Q. St. Boniface, Man.



World's Largest Makers of Dissolved Acetylene

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MACHINE SHOP FOR SALE PARTLY EQUIPped. A good chance for experienced superintendent with small capital to carry on business already started. Excellent location in Toronto with good prospects. Box 580, Canadian Machinery. (c20m)

WANTED SECOND-HAND VERTICAL shear or punch to use as pipe crusher. Capacity to shear 3½" Square Bar, ram about 22" wide, 8" thick and 6" stroke. Reply Box 605, Canadian Machinery.

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EXECUTIVE POSITION WANTED—DO YOU require a man to take charge of either your Purchasing or Accounting Department? One who has initiative, and is not afraid of hard work or responsibility. Have had seven years' experience on foundry and general machine shop work, four of which was on munitions. If interested apply to Box 604, Canadian Machinery.

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Sentinal

Series B. D. Size No. 3.

Mfg., Alley-McLennan, Glasgow, Scotland. Stroke 16½" x 10" x 8, Speed 345 R.P.M. Piston Displacement 600 ft. free air per minute at 100 lb. pressure.

Twin Cylinder, Vertical direct connected with C.G.E. 125 H.P. 550 V., 3 P., 60 C. Motor. Quotation, complete with Starting panel 150 B.H.P. ammeter, Automatic Oil Switch, T. 20 B. Controller and Starting Rheostat.

Also quantity used lathes, motors, etc.

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CANADIAN JUST RETURNED FROM U.S.A., A1 mechanic in all branches of the trade; have held executive positions continually for the past 14 years in U.S.A. in the following capacities: Tool room foreman, master mechanic and superintendent, have handled successfully up to 700 hands; last position (for the past 3 years) was superintendent of a large machine tool company, manufacturing broaching machinery and broaching tools, a line the Canadian market needs. Willing to start at a moderate salary; can furnish A1 references. Box 583 Canadian Machinery. (c20m)

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16	*" —Stock*
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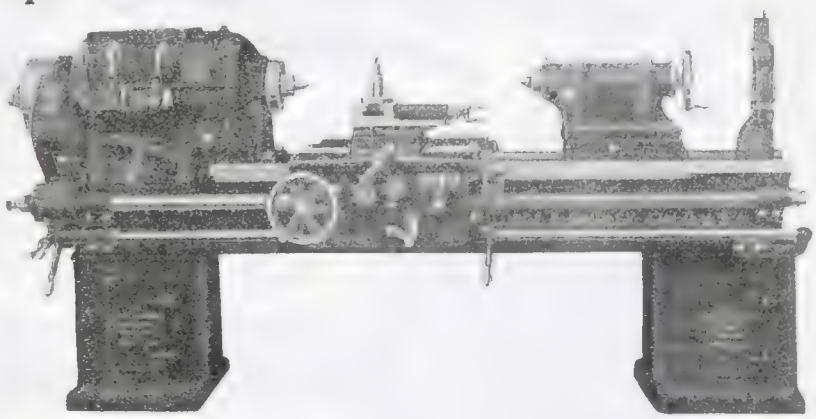

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14" x 6' New Carroll-Jamieson Quick-Change Lathe
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17" x 8' New National Quick-Change Lathe
3—17" x 8' New Sidney D.B.G. Quick-Change Lathe, swing 19"
17" x 10' New Sidney D.B.G. Quick-Change Lathe, swing 19"
18" x 24" New Rahn Larmon Lathe, D.B.G. Quick-Change
19" x 10' New Sidney D.B.G. Quick-Change Lathe, swing 21"
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33" x 14' Putnam, arranged fo. Motor Drive
6' Western Radial Drill
5' Bickford Single Pulley Drive Radial
100-lb. New Little Giant Hammer
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THAT'S INSPIRATION!

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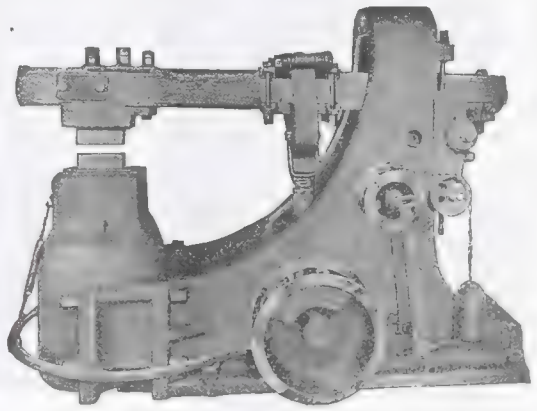

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It is a well-built, substantial tool for welding and general forging. MADE IN SIX SIZES, 25-lb to 100-lb. Heads and two styles of frame.

Send for our HELVE HAMMER BOOKLET, and give us information regarding character of your work.

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Thor

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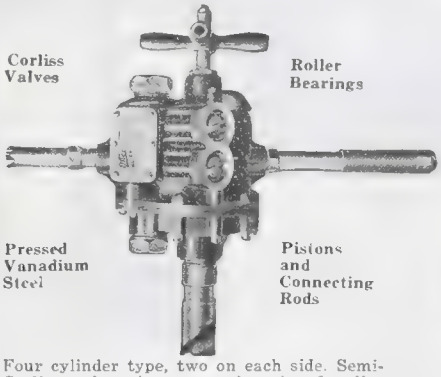
Piston Air Drills and Reamers



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Four cylinder type, two on each side. Semi-Corliss valve close to each pair of cylinders gives greater efficiency and power saves clearance losses and allows air to enter cylinders at full pressure of the pipe line.

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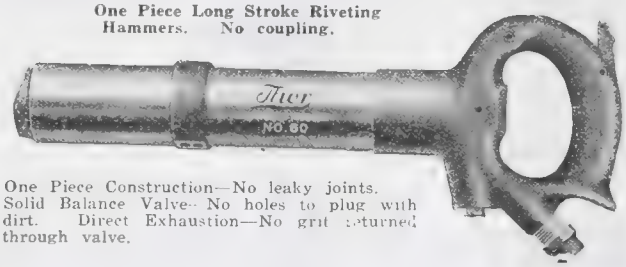
One Piece Long Stroke Riveting Hammers. No coupling.



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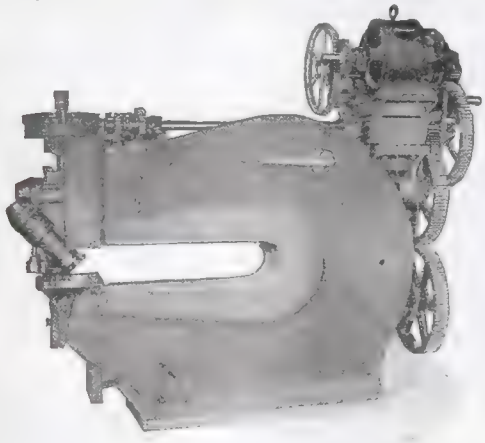

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Eliminates Oxyacetylene Cutting and Plate Planing

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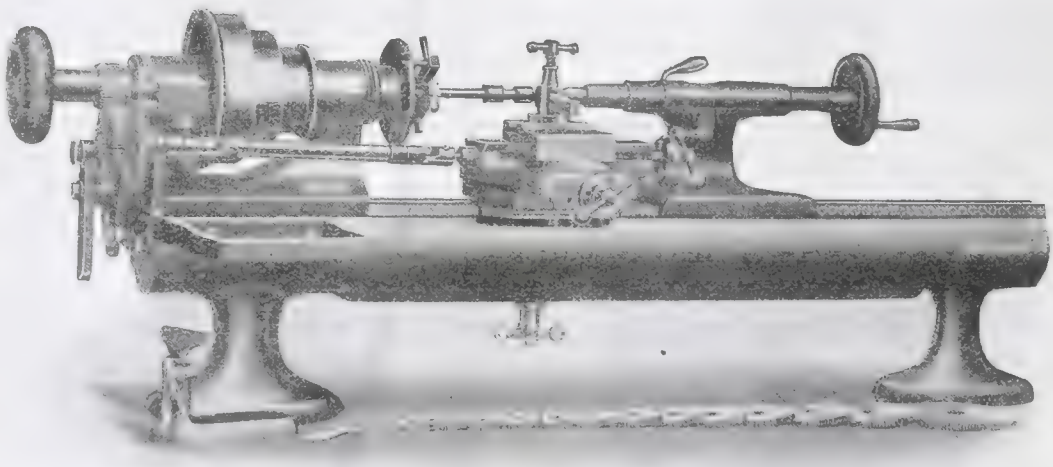

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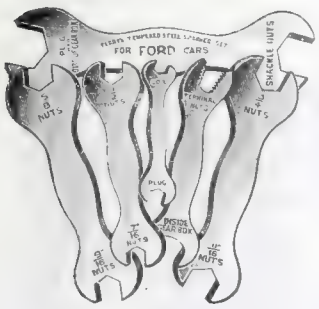

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In the Homeland we have been styled "Wizards in metal manipulation" so wondrous is our range and versatility. We exist for service.

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The Spring and Presswork Specialists

REDDITCH ENGLAND

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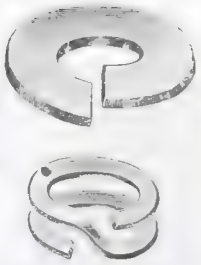

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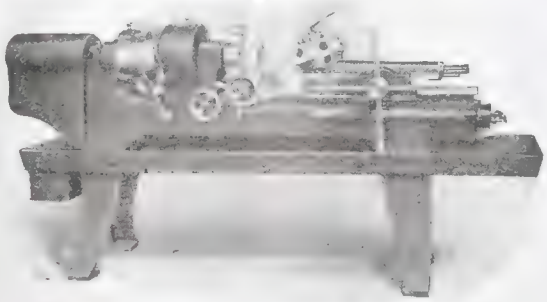

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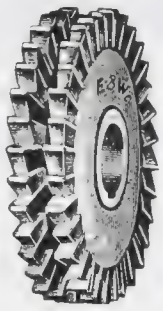
MILLING CUTTERS AND SMALL TOOLS



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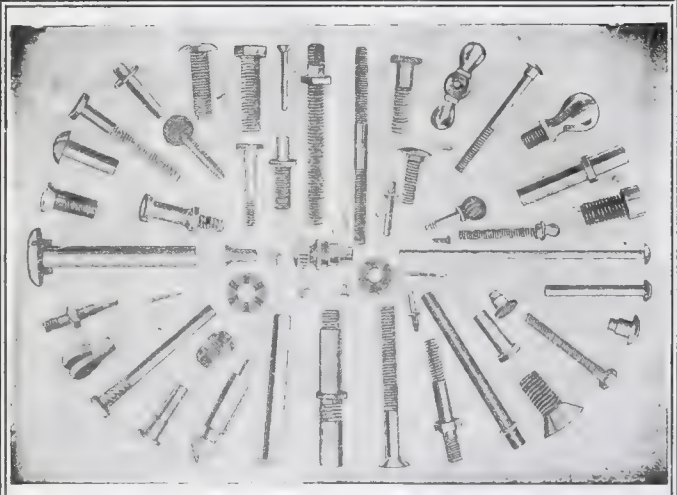

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With the Hurlbut, Rogers Cutting Off and Centering Machine you can double the amount of work now done, thereby reducing your cutting off cost one half.

The cutting tools are arranged so that one is cutting up while the other is cutting down, both tools working in the same cut and one tool acting as a rest for the other. The machine is tried and proven it is in hundreds of shops. Write for details.

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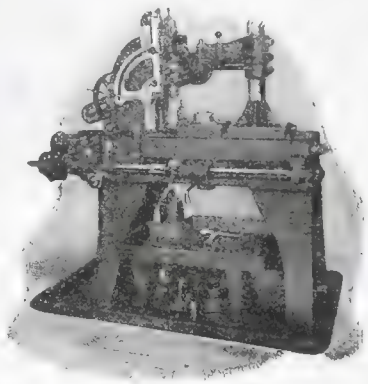

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AUTOMATIC
Gear Cutting Machine

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All of the highest possible quality made in Canada by contented, intelligent experts in the largest and best equipped plant of its kind in the Dominion.

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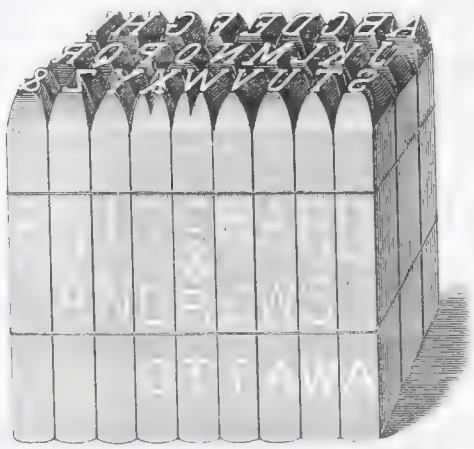

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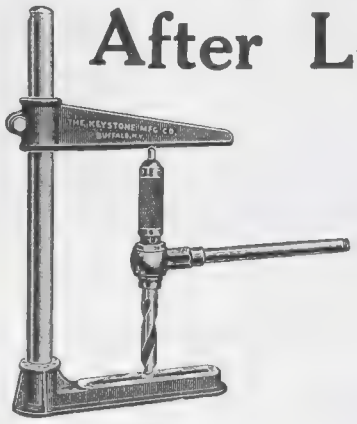

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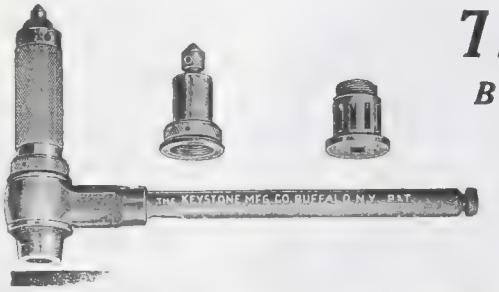
We like to think that the reputation of Keystone Tools is built upon a foundation of service with **Quality** the Keystone rather than a copyrighted name. For it is conceivable that imitators, or even the whims of courts, might rob us of our copyrighted name. But who could take "Keystone Quality" from Keystone Tools?

Write for name of nearest dealer.



The Keystone Mfg. Company

Buffalo, N.Y., U.S.A.

GREY IRON Castings

Special Equipment Built to Specification
Steel Plate and Structural Steel Work
Quality and Prompt Service Double-Sure

WILLIAM HAMILTON COMPANY, LIMITED, Peterborough, Ont.

STEEL TANKS

THE TORONTO IRON WORKS LIMITED

HEAD OFFICE: ROYAL BANK BLDG. TORONTO WORKS: CHERRY STREET

Oil Storage, Gasoline Tanks, Air Receivers, Pneumatic Water Supply Tanks, Smoke Stacks, Boiler Breeching, Riveted Steel Pipe, Bins and Hoppers. Heavy and light steel plate construction erected anywhere.

BELTING

What Belts Should I Use

(Continued from April 24th issue of Canadian Machinery)

FOR MAIN BELTS AND DIRECT DRIVES
FOR SHIFTERS
FOR OILY PLACES
Foundry Gases, Etc.

PROFIT BY OUR LONG BELTING EXPERIENCE. Read closely the following advice re the installation of belting. We feel sure that by doing so you will not only increase belting service, but save much money, time and trouble

MAIN BELTS AND DIRECT DRIVES.

Leather, Rubber, Balata and Scandinavia belts can all be used for the above conditions, but the type best adapted for the work must be judged by the requirements. At the present time leather is very expensive, Balata is cheaper and Scandinavia very much cheaper. If an endless spliced joint is required, use Balata. We can make these splices at our own warehouse and do it quickly. Scandinavia belts can only be made endless at the plant in England, and this delay puts it out of the reach of most of our customers. To fasten Scandinavia belts, if no idler is used, we strongly recommend the Crescent plate, if there is no idler or tightener pulley used we have found the clipper lace to be one of the most satisfactory. We are not special agents for either of these fasteners, but are mentioning them merely to give our customers service. Both Scandinavia and Balata Belts will last well on direct drives.

SHIFTERS.

So many textile belts have fallen down in use with belt shifters that the public are depending on leather almost exclusively. We have been watching the performance of Scandinavia belting for years on shifters and we have found that if a good smooth shifter is used, Scandinavia will stand up well. The cross section of the Shifter should be oval or be provided with rollers. A home-made shifter made of round iron is an abomination and should be discouraged. Any mechanic knows this. Do not use Balata Belting when shifters are used, and we do not recommend any ply belt for this purpose. Scandinavia belting is solid woven with an edge especially designed to resist the wearing action of the shifters. Even if the edge does wear through, as it sometimes does, the belt is still good. We have sold lots of this belting to the munition plants for use with shifters.

OILY PLACES.

If oil is dripping on the belt, Leather, Rubber and Balata are all placed at a disadvantage. Scandinavia is the belt for this. Oil will not greatly diminish the life of the belt, but it must be wiped off to keep the belt from slipping, as a slipping belt is sure to crack sooner or later. An adhesive should also be applied to the pulley side of the belt. We can supply an excellent adhesive dressing from stock. By the way, this adhesive should not be used on leather or ply belts as it is apt to open up the plies.

FOUNDRY GASES.

Leather and Rubber are at a disadvantage here. Either Balata or Scandinavia belting can be used satisfactorily under these conditions.

THE CAUSE OF BELTS CRACKING.

Belts are sometimes found to crack across the width. This is due to slipping, and at the first intimation of such a crack, the cause must be removed, or the whole belt will soon be ruined. If the belt is too loose it must be tightened. If there is oil on the belt it must be removed, and an adhesive used if the belt is of a type that will stand an adhesive. Perhaps the belt is too heavy for the pulley diameter, or perhaps the belt is overloaded. Slipping would result from either, which would cause the cracking.

SCANDINAVIA BELTING

Did you notice the advice given in our ad in April 24th issue of CANADIAN MACHINERY? If not, be sure to look it up.

LANCO BALATA BELTING

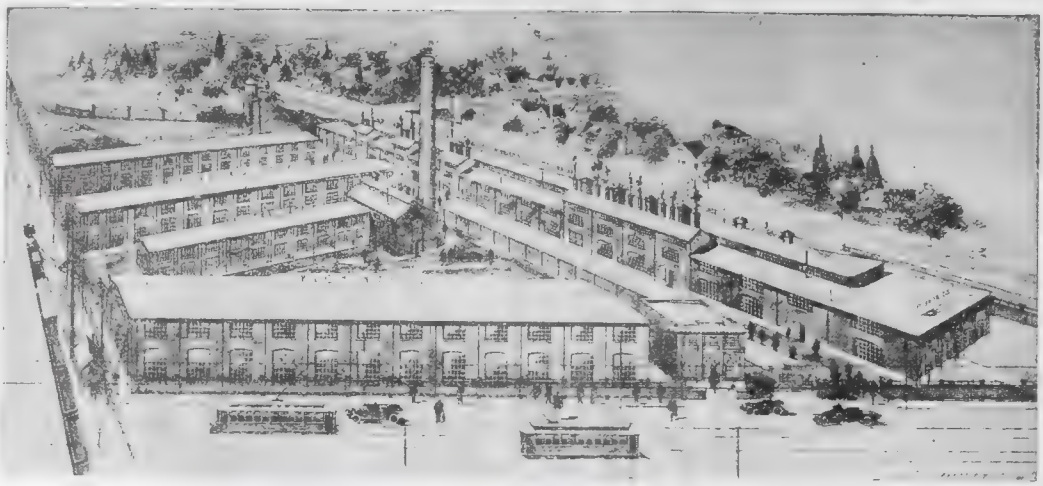
FEDERAL ENGINEERING CO., LIMITED
172 John St., Toronto

We are. Growing

When our plans are completed, "HISCO" will be the largest plant of its kind in Canada.

Two big new electric furnaces are being added to our present large equipment. And cleaning and annealing department measuring 300′ x 100′ is about to be completed.

This will place us in a position to handle orders big and small with unequalled facility.



Specify "HISCO" Products

Quality and Service Guaranteed

Steel, Chrome, Manganese and Nickel Steel Castings

Annealed and Unannealed

Cement Mill and Mining Machinery Castings, Stamp Mills, Crushing Plants, Excavating Outfits, Steel Car Wheels, Locomotive Driving Wheels and Frames, etc.

GEARS Machine Moulded, any size up to 18 feet, without Patterns

HULL IRON & STEEL FOUNDRIES, LTD., HULL, QUE.

Her Sure Touch

Her deep-rooted desire to do thoroughly whatever work is expected of her makes

WOMAN

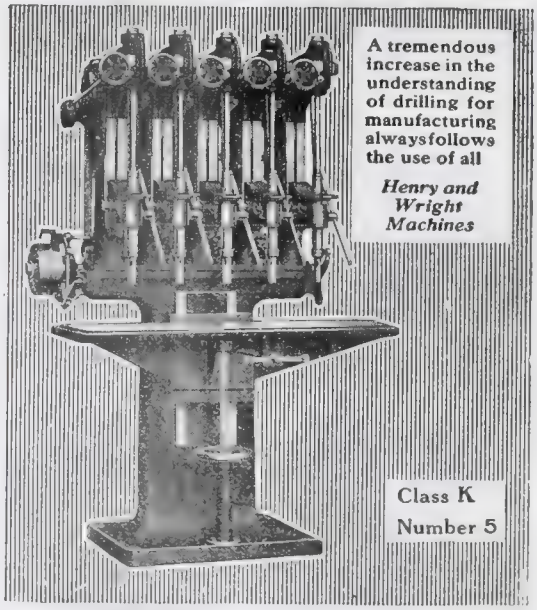
ideally fitted for operating the Grant

Silent Riveter

Instead of nerve-racking, hammer-like blows; with this Grant Rotary Rivet Spinning Machine there is absolute quiet. Noiseless twin rolls, revolving independently of each other, roll heads on the rivets under pressure. One rivet every second, and never a bent shank, whether rivets are soft brass or hard steel. Heads finished perfectly smooth, show no mark of the riveting tool.
Thousands of articles now being riveted on Grant Noiseless Riveters. **Write.**

GRANT
Mfg. and Machine Co.
BRIDGEPORT, CONN., U.S.A.

HENRY & WRIGHT
Drilling Machines



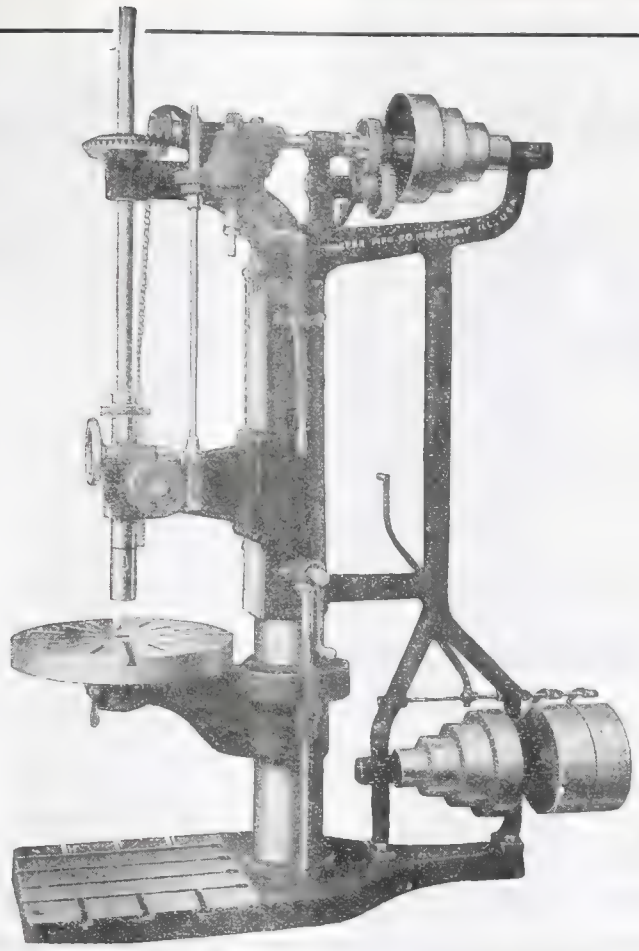
A tremendous increase in the understanding of drilling for manufacturing always follows the use of all

Henry and Wright Machines

Class K
Number 5

The Henry & Wright Mfg. Co.
Hartford, Conn.

Canadian Fairbanks-Morse Co., Montreal, Toronto, Winnipeg. A. R. Williams Machinery Co., Toronto, St. John, N.B. H. W. Petrie, Ltd., Toronto; Williams & Wilson, Montreal. Rudel-Belnap Machinery Co., Montreal; Canada Machinery Corp., Galt, Ont.; Geo. F. Foss Machinery & Supply Co., Montreal. General Supply Co., Montreal.



HŒFER

For Precision Drilling

For over 25 years the name Hoefer has been associated with drilling equipment. Drillers have been our specialty.

Hence it is only natural that Hoefer Drillers should embody the latest word in design, efficiency and accuracy.

And they do. Regardless of the size of press, drilling to a fine degree of precision is always possible.

Hoefer Drillers are looked upon as a recognized standard—the standard by which satisfactory service can be measured.

Catalog showing complete line on request.

HOEFER MFG. CO.
Freeport Illinois.

DRILLERS

"WACO"

REGISTERED
"WACO"
TRADE MARKS

High Speed Steel

"Double Waco" Quality—for Quick Production Work.

"Turtle Brand"—High-class Tool Steels, Files and Drills.

Wortle Plates for Wire Drawers.

MANUFACTURED BY

WM. ATKINS & COMPANY, LIMITED

RELIANCE STEEL WORKS Established 1870 SHEFFIELD, ENGLAND

Sole Representatives for Canada:

MARSHALL, SON & BUNNEY

39 Richmond Street East - - - TORONTO, ONT.

Ask for Quotations on Iron and Steel

We have in stock for immediate shipment the highest grade Bar Iron, Black and Galvanized Sheet Iron, Machine Steel, Cast Steel, High Speed Steel, Cold Rolled Steel, etc.

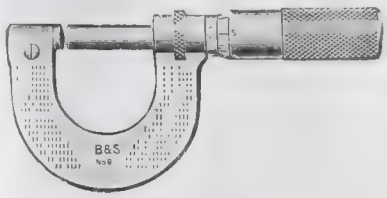
Machinist's Tool Chests

Time and again skilled machinists have remarked on the strength of construction and compact design of our Tool Chests. Have us give you full particulars.

CRESCENT BELT FASTENERS

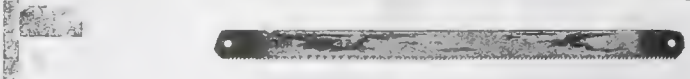
Clinch beneath the surface of the belt on the pulley side—no part in contact with the pulley. They maintain uniform grip the entire width of belt and never weaken from wear.

Micrometer and other fine tools



Select from such wholly dependable makes as Starrett or Brown & Sharpe, or from other makes you have proven in your own shop to be most durable and efficient. Our stocks are complete.

"Victor" Hack Saw Blades for Tough Metal



Durable, fast-cutting blades that you can rely upon to cut true through toughest metals. Users have found that these blades increase every day's output and serve much longer than ordinary blades.

Write us about your requirements.

RICE LEWIS & SON, LIMITED

Established 1847 **TORONTO, ONT.** **19 Victoria Street**

Opportunity Knocks Here Every Week!

It may not knock for **you** this week, but read these pages regularly and grasp the opportunity when it presents itself. Every ad here is an opportunity for someone! Your time is coming. If you think the time is ripe to spring that little proposition of yours, send in your copy now for the next issue. If it is of interest to our readers, rest assured it will get attention.

CANADIAN MACHINERY

Classified Advertising Section

143 University Avenue **TORONTO**

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Direct and Alternating Current
Capacities: 2 Tons to 200 Tons

BRIDGE CRANES for all purposes

Including Power House, Foundry, Shop, Steel Works and other uses

Also

REVOLVING TOWER CRANES

for Shipbuilding and Fitting-out Berths

DOMINION BRIDGE COMPANY, LIMITED

Head Office: Montreal, P.Q.

Branches: OTTAWA, TORONTO, WINNIPEG

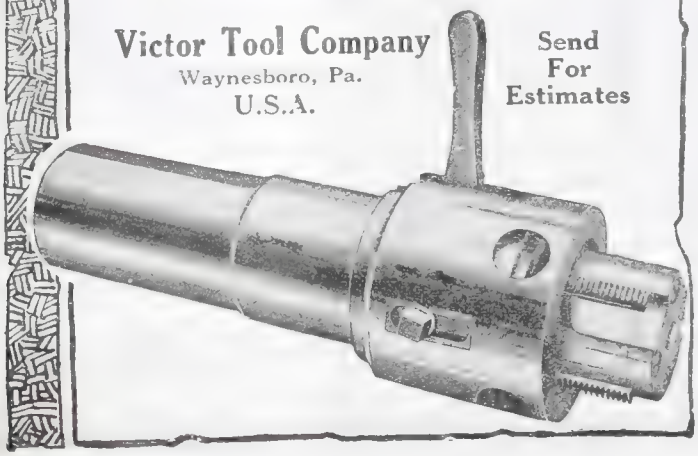
We wanted something original—this is what we got

"BOTH in these operations and half another — I'll show you later — completed in the time our old taps took to do one; that, I guess, is why we continue to use your Victor Collapsible Taps."

It was the often-heard story of time saved, of costs lowered, of all threads clean and smooth. And it was pleasant to hear.

Victor Tool Company
Waynesboro, Pa.
U.S.A.

Send For Estimates

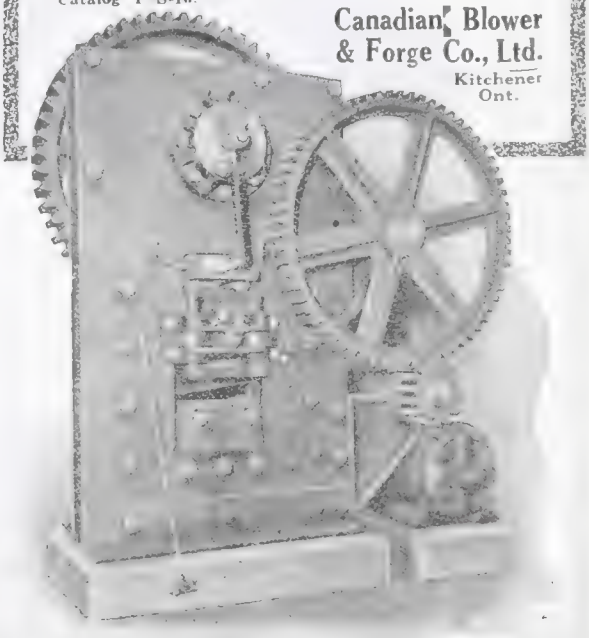


CANADIAN ARMOR PLATE

PUNCHES, SLITTING SHEARS, and BAR CUTTERS are dependable. They are built of "Armor Plate" steel—tensile strength 75000 lbs. per square inch—7½ times as strong as cast iron.

That means a lighter and stronger machine a machine built to take a lot of punishment. **Write for Catalog P S-16.**

Canadian Blower & Forge Co., Ltd.
Kitchener Ont.



Does Your Storage System Save Oil?

If you have never studied the question of storing, distributing and using oils, you will be surprised to know the enormous losses that occur daily wherever oils are handled by inefficient methods. Losses that could easily be prevented by use of

BOWSER OIL STORAGE SYSTEMS

Such Conditions Are Wasteful, Dangerous, Unnecessary

Save All the Oil!

Store oils in leakproof, dirt-proof tanks. There is no loss of oils from any source, no loss of quality. Labor in handling is cut to the absolute minimum.

Write for literature describing equipment for your needs.

S. F. BOWSER CO., LTD.

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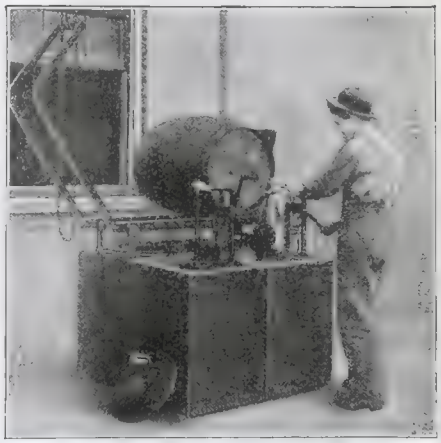
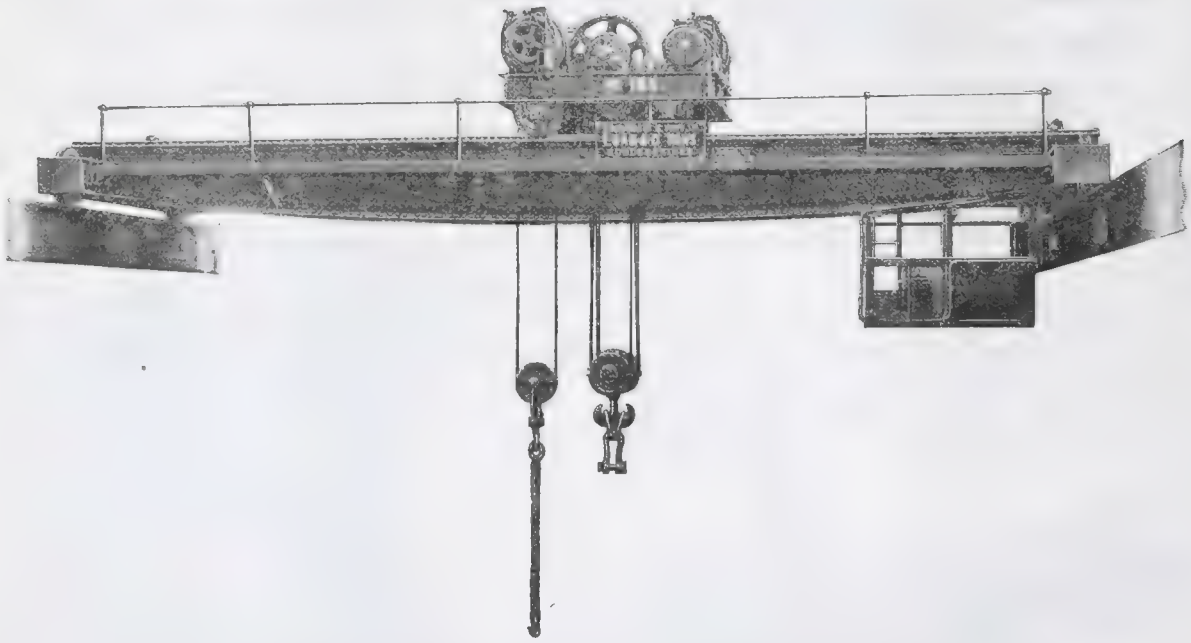


The Bowser Way—Safe, Loss-proof, Convenient, Clean, Systematic

ELECTRIC CRANES & CAPSTANS



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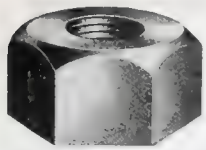
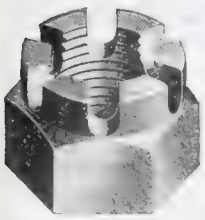
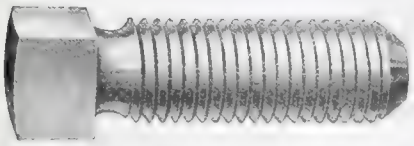






Screw Machine PRODUCTS

Standards in Stock

NUTS

Plain and Castellated -- S.A.E. -- Semi-Finished -- V. -- U.S.S.

SCREWS

Cap -- V. -- U.S.S. -- S.A.E. -- Set -- U.S.S. -- V.

Special Parts

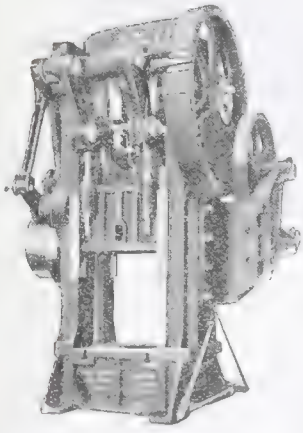
made to customers' specifications. Sizes up to 2-1/4" diameter, 10-1/2" long.

THE NATIONAL ACME COMPANY

De Courcelles and G.T.R. MONTREAL, P.Q.

The "TOLEDO"

TOGGLE DRAWING PRESSES



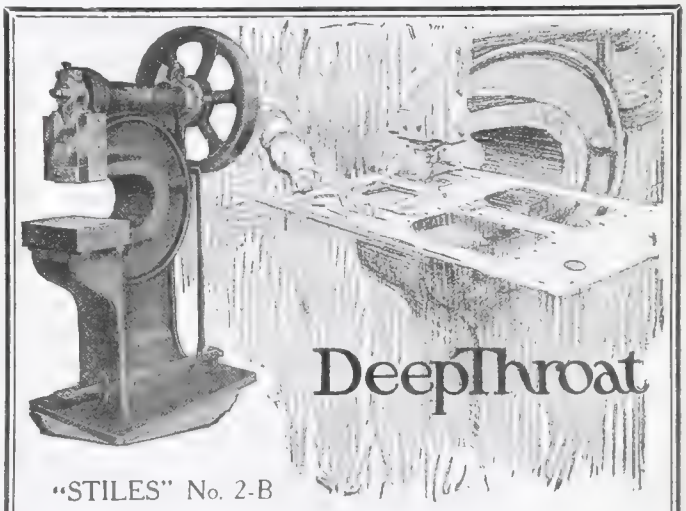
They have achieved almost incredible results in deep drawing and stamping work. The toggle mechanism is simple and effective — secures a perfect dwell of the back holder and exerts all the required power.

Toggle arms, rocker arms and yokes are all steel with inserted bronze bushings at each bearing; these operate on high carbon hammered steel—self-lubricated studs.

80 sizes for all classes of work

The Toledo Machine & Tool Co.

Toledo, Ohio



"STILES" No. 2-B

For reaching into the center of large sheets of metal, this model of the "Stiles" type of Press is provided. The massiveness of the frame and its special design make it rigid, even under the most severe punching strains.

E. W. BLISS CO.

Brooklyn, N.Y., U.S.A.

1857 CHICAGO OFFICE DETROIT OFFICE 1918
Peoples Gas Bldg. Dime Bank Bldg.
CLEVELAND OFFICE - Union Bank Bldg.
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CRANES
All Kinds
GEO. ANDERSON & CO. of CANADA, Ltd.
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PRESSES and SHEARS
Sheet Metal Working Machinery
THE D. H. STOLL CO., INC.
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JAMES BALLANTYNE
HEATING and PLUMBING CONTRACTOR
ALSO
MACHINE SHOP and BLACKSMITH WORK
163 NAZARETH ST.
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Machine Work Wanted for Lathes, Shaper, Milling Machine and Planer, etc.

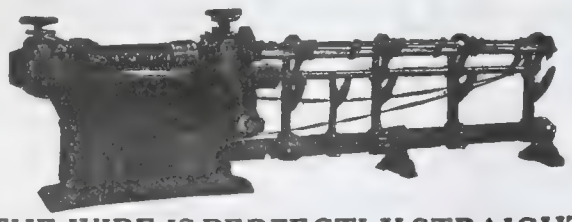
Quotations given on all classes of work. Wrought Iron Pipe Bends made to order, ¼ to 8". Pipe Cut and Threaded, ⅛ to 12".

Write for Prices.

TRADE MARK
BRISTOL'S
REG. U. S. PAT. OFF.CE.
ELECTRIC PYROMETERS
FOR EVERY SERVICE

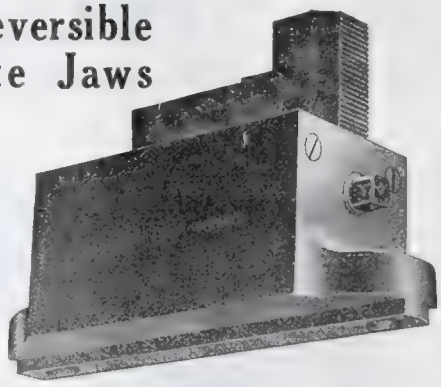
Bristol's Recording Pyrometer furnished with patented frictionless smoked chart recording system, especially valuable for processes requiring continuous heat treatment.
Simplicity of construction and ruggedness make them ideal shop pyrometers. The ONLY pyrometer equipped with Weston milli-voltmeter movement.
Write for Bulletin I-205.

THE BRISTOL CO.
WATERBURY, CONN., U.S.A



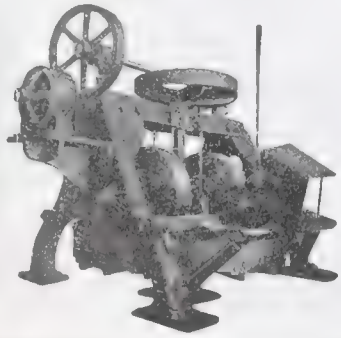
THE WIRE IS PERFECTLY STRAIGHT
and cut to accurate lengths when it comes from our AUTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINE, whether it's ¾" diameter or only .020" wire, hard or soft wire, highly polished or rough stock.
May we send you catalogue C?
The F. B. SHUSTER COMPANY, New Haven, Conn.
Formerly John Adt & Son. Established 1866.
Also makers of Riveting Machines, Sprue Cutters, Cotter Pin Machines, etc.

Skinner Reversible Face Plate Jaws
Everything in the line of Chucks.
Write for illustrated catalog.
Iron or Steel Body, Single Rib for Large Lathes and Double Ribs Boring Mills.
THE SKINNER CHUCK CO.



Factory and Main Office: New Britain, Conn.
New York Office 94 Reade St | San Francisco Office Rialto Bldg | London Office: 149 Queen Victoria St.

Canadian Steel Foundries Need Frost Improved Sand Mills



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Heavy Mullers
Unloading Device
Motor or Belt Drive

The Frost Mfg. Co.
112 W. Adams St., Chicago

BriggsMillers
Briggs Millers are wide range manufacturing machines, capable of heavy cuts and high speeds.
For many classes of work they are the most economical that can be installed.
Gooley & Edlund Inc.
Cortland, N.Y., U.S.A.
Allied Machinery Co. of America, Paris, Turin, Zurich, Petrograd, Barcelona; Burton, Griffiths & Co., Ltd., London, Manchester and Glasgow; Andrew & George, Tokyo.

DIAMOND POINTED TOOLS

Our line comprises Diamond Pointed Tools for every industrial purpose. We are also equipped to furnish promptly special Diamond Pointed Tools of every variety. Quality products.

ORDER FROM ST. CATHARINES if more convenient. Complete stock — quick service. Goods submitted on memorandum to responsible firms.

Wheel Trueing Tool Company, 88 West Pitt Street, Windsor, Ontario

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WE SELL METALS OF ALL KINDS

SCRAP
Copper, Brass
Lead, Babbit, Etc.
INGOT
Copper, Lead
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STEEL
RAILROAD CAP AXLES,
BARS
BILLETS
ETC.

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DARLING BROTHERS, LIMITED

Engineers, Manufacturers and Founders
120 Prince Street, MONTREAL, P. Q.

Pumps for any Service—Steam Appliances—Freight Elevators—Webster Vacuum Heating System.

ARMSTRONG CLAMPS and DOGS

DROP FORGED STEEL
ALL SHAPES
ALL SIZES

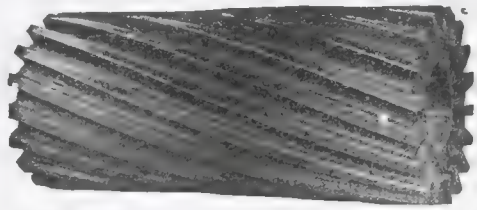
Best Quality---All Alloy Steel Screws

COMPLETE CATALOG FREE

ARMSTRONG BROS. TOOL Company
"The Tool Holder People"
306 N. Francisco Avenue CHICAGO, U.S.A.

Taylor-Newbold Milling Cutters

Fas Cutting
Power-ful



Inserted Helical Blades of High Speed Steel

Will outlive and out-cut any other on the market
4-in. Diameter for General Use.

Send for Bulletin R-P and 30-day trial offer.

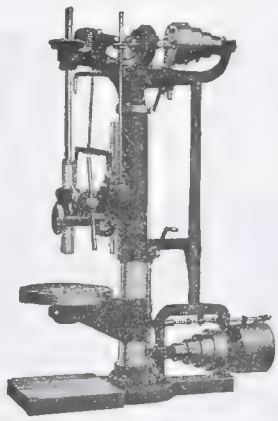
THE TABOR MANUFACTURING COMPANY
PHILADELPHIA, PA., U.S.A.

Greenfield

Trade Mark Reg. U. S. Pat. Office

A universal grinder. A grinder with all attachments. A grinder that will handle all kinds of tool-sharpening as well as cylindrical, internal and surface grinding. An all-around machine for your tool-room.
Catalog No. 6.

Greenfield Machine Co.
Greenfield, Mass., U.S.A.



6 Positive Geared Feeds

instantly obtained, are but one of many advantages provided by

SILVER DRILLS

For 64 years these upright Drilling Machines have served well in the States and Canada.

Write for full description of our 20" and 25" sizes.

The Silver Manufacturing Co.
290 Broadway Salem, Ohio

THE DAVIS MILLING ATTACHMENT

and Compound Table

For the Die Maker, Repair Shop, Pattern Maker or Garage; will perform more than 90% of the jobs that come up.

For any Drill Press 14" to 42" swing. Big Economy — Big Convenience— Small Price. It relieves your large millers, comes in handy spotting castings, milling ends of bosses, and many other odd jobs. Cuts all kinds of keyseats perfectly; mills deep grooves, slots and cams. We also make cylinder reamers for reboring Ford car, and a reliable air compressor—all at special factory prices. Write for circulars to-day.

Hinckley Machine Works, HINCKLEY ILLINOIS

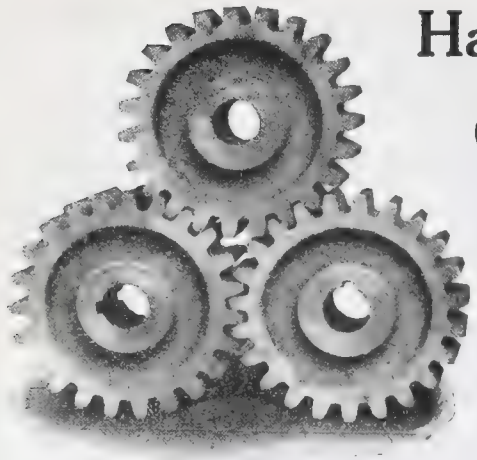
NORTHERN CRANES

"MADE IN CANADA"

Electric Travelling Cranes, Hand Cranes, Electric Hoists, Air Hoists, Foundry Equipment, Cupolas, Ladles, etc., etc.

"Type D"

NORTHERN CRANE WORKS LIMITED
WALKERVILLE, ONTARIO



Hamilton Gear Co.

Van Horne St.

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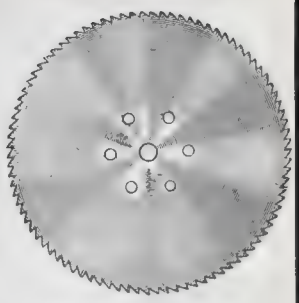

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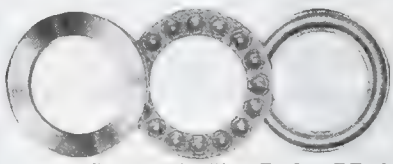

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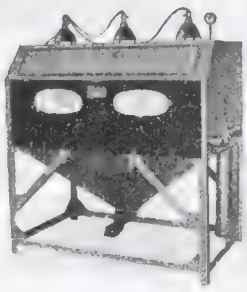

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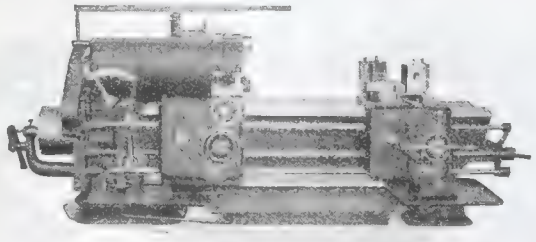

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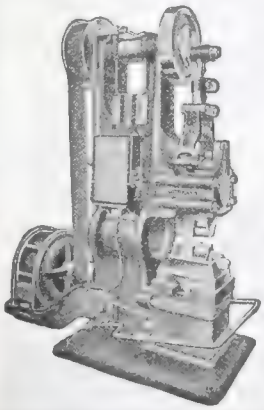

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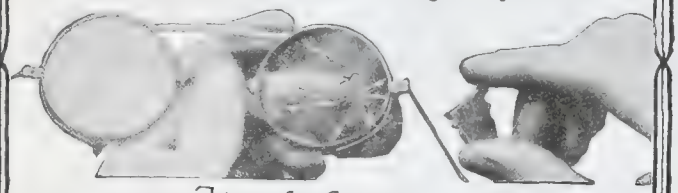
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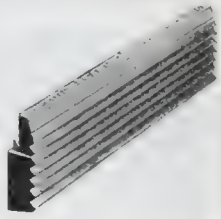

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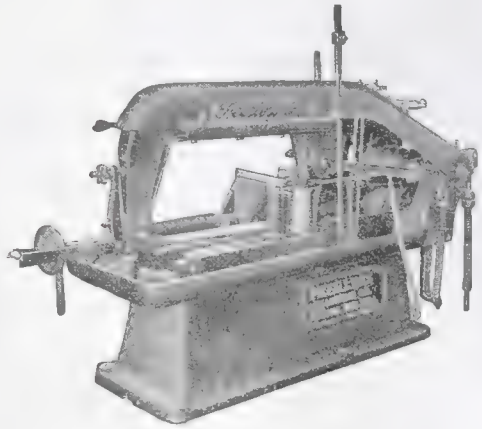

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Better Days Ahead for the Steel Trade

ANOTHER good sign with a bearing on the same outlook is the condition of the steel business. It is pointed out in THE FINANCIAL POST of May 24th that the removal of the price fixing machinery in the States is having a good effect on the industry, and will before long bring out the orders which have been so long in abeyance over the border to the detriment of Canadian conditions as well as U.S. conditions. A hint is given in the same article that prices of plates may take an upward trend. These articles in THE POST are worth close attention. They take their place in the splendid new service on all business conditions affecting Canada, which you find every week in THE POST.

The Labor Situation Comes in for Constructive Comment

"IS an Eight-hour Day Equitable?" is the subject of an editorial in this issue of THE POST. In this article you will find aspects of the labor question investigated with clear, logical mind, and presented in manner to substantiate your most business-like opinions on the situation. From the first THE POST has taken the sane business attitude on the labor question, and upholds the cause of constructive business as against destructive Bolshevism.

A Special Issue of Special Interest

THIS week's issue of THE POST is a special one, and contains in its 32 pages, an immense amount of valuable business information centred about the trust and loan business (which is dealt with in a special 16-page section). The other 16 pages of this issue are well filled with factful information on current Canadian affairs in terse, readable form, which active business men find very valuable and time-saving. THE POST will keep you informed on Canadian business matters in a way unrivalled by any other publication. Send for a subscription to-day for yourself or for your assistant. The price is $3.00 per year, and you have only to fill in this form.

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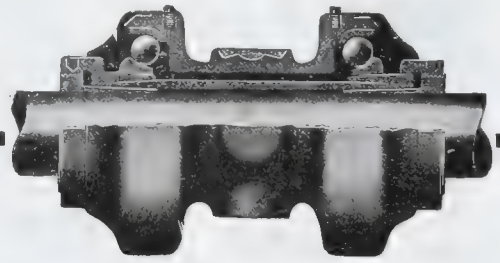

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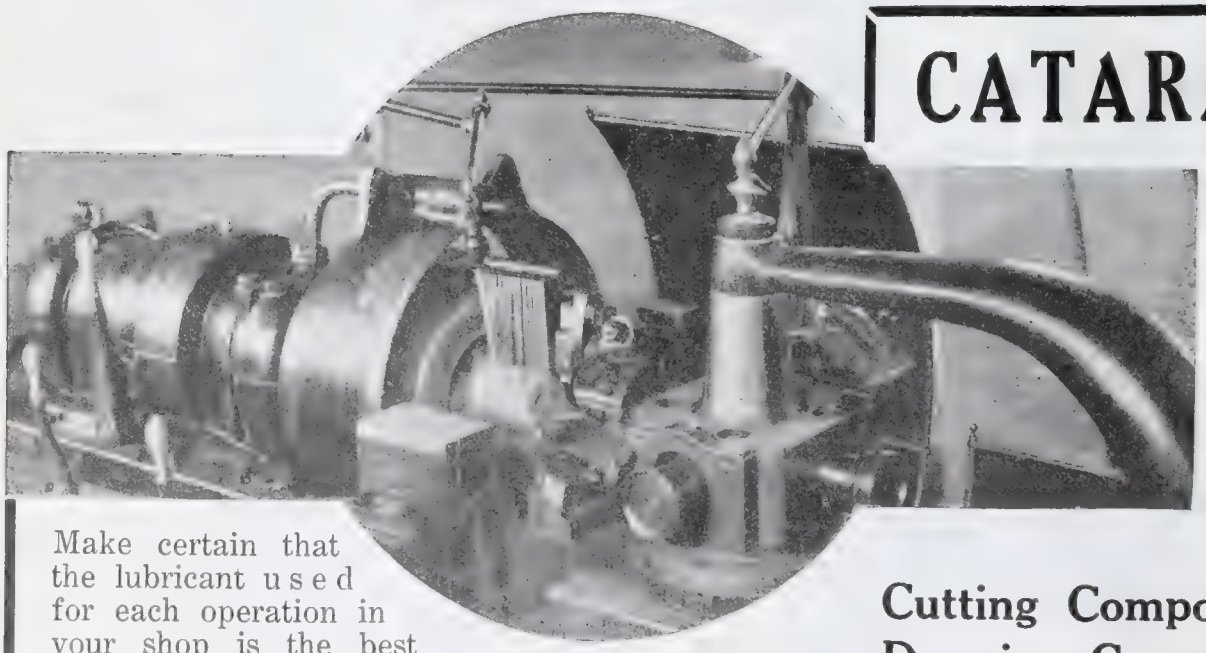

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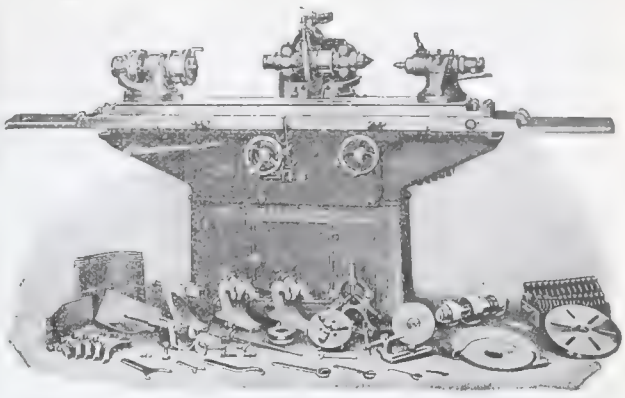

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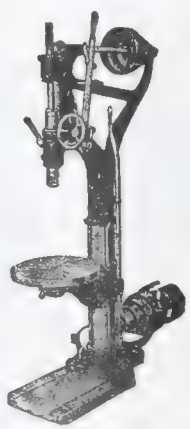

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Welding & Supplies Co., Montreal, Que.

CYANIDE AND LEAD BATH POTS
Swedish Crucible Steel Co., Windsor, Ont.

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Ford-Smith Machine Co., Hamilton, Ont.
Smalley General Co., Inc., Bay City, Mich.

CYLINDERS, AUTOMATIC REBORING JIGS AND REAMERS
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Kelley Reamer Co., Cleveland, O.

DEEP DRAWING DIE STEEL
J. F. A. Comstedt, New York City, N.Y.

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Dominion Bridge Co. Montreal.
Morris Crane & Hoist Co., Herbert, Niagara Falls, Ont.

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Ford-Smith Machine Co., Hamilton, Ont.
Joyce-Koebel Co., Inc., New York City.
Wheel Trueing Tool Co., Windsor, Ont.
Wheel Trueing Tool Co., Detroit.
Williams & Wilson, Limited, Montreal, Que.

DIAMONDS, CARBON & BORTZ
Wheel Trueing Tool Co., Detroit.

DIAMONDS, BLACK AND ROUGH
Joyce, Koebel & Co., Inc., New York.
Wheel Trueing Tool Co., Windsor, Ont.

DIE BLOCKS
General Steel Co., Milwaukee, Wis.

DIE HEADS, AUTOMATIC
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Wells Bros. of Can., Galt, Ont.
Williams & Wilson, Limited, Montreal, Que.

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Pittsburgh Steel Stamp Co., Pittsburgh, Pa.

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Butterfield & Co., Rock Island, Que.
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Wells Brothers Co. of Canada, Galt, Ont.

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Banfield, W. H., & Son, Toronto.
Boker & Co., Inc., H., Montreal, Que.
Butterfield & Co., Rock Island, Que.
Brown, Boggs Co., Hamilton, Ont.
Canadian Fairbanks-Morse Co., Montreal.
The Geo. F. Foss Mchy & Supply Co., Montreal.
Gardner, Robt., & Son, Montreal.
A. B. Jardine & Co., Hespeler, Ont.
Landis Machine Co., Waynesboro, Pa.
Modern Tool Co., Erie, Pa.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
National Acme Co., Cleveland, Ohio.
Pratt & Whitney Co., Dundas, Ont.
Rice Lewis & Son, Toronto, Ont.
Rickert-Shafer Co., Erie, Pa.
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Wells Brothers of Canada, Galt, Ont.
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Butterfield & Co., Rock Island, Que.
Landis Machine Co., Waynesboro, Pa.
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Wells Bros. of Can., Galt, Ont.

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9 ft.	18 ft. circle	12 ft.
11 ft.	22 ft. circle	14 ft.
13 ft.	26 ft. circle	16 ft.

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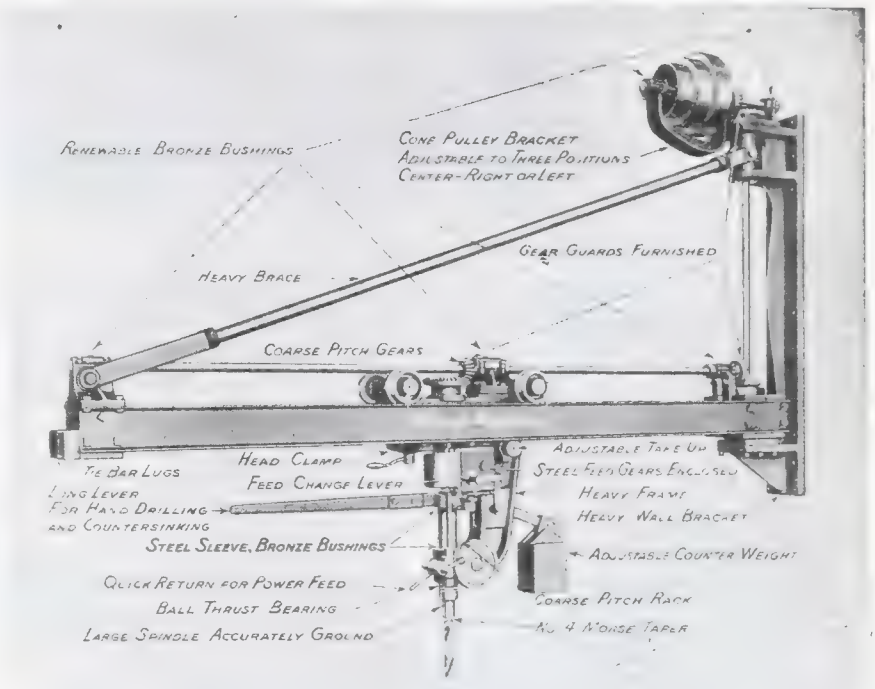

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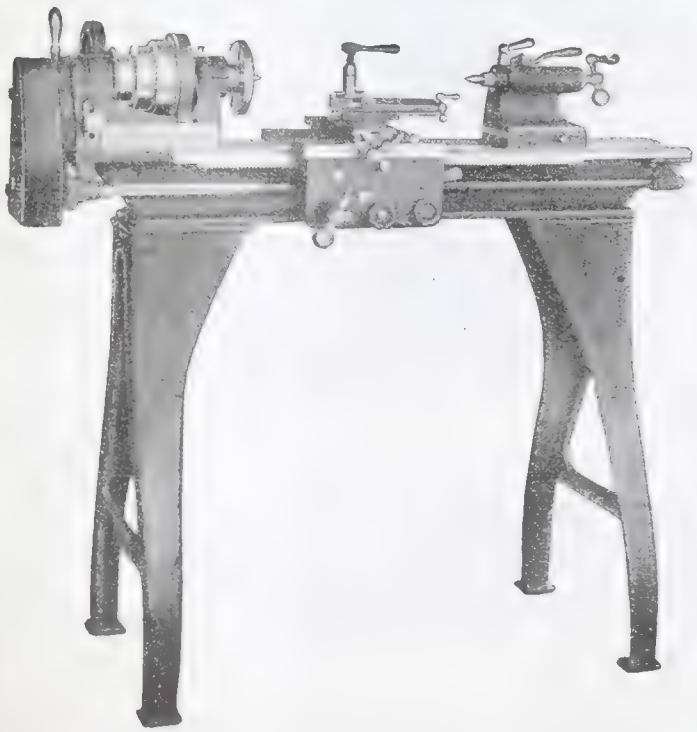

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Morrow Screw & Nut Co., John, Ingersoll, Ont.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Co., Dundas, Ont.
Rice Lewis & Son, Toronto, Ont.
Wilt Twist Drill Co. of Canada, Walkerville, Ont.

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Morse Twist Drill & Mch. Co., New Bedford, Mass.
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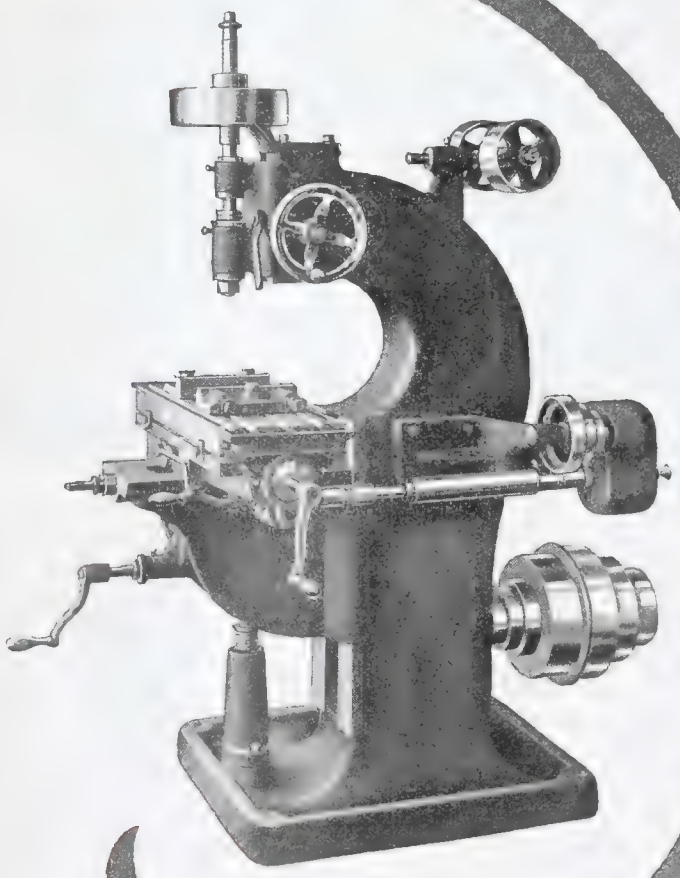

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Brown, Boggs Co., Ltd., Hamilton, Ont.
Canada Machinery Corp., Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
National Machinery Co., Tiffin, Ohio.
Williams & Wilson, Limited, Montreal, Que.

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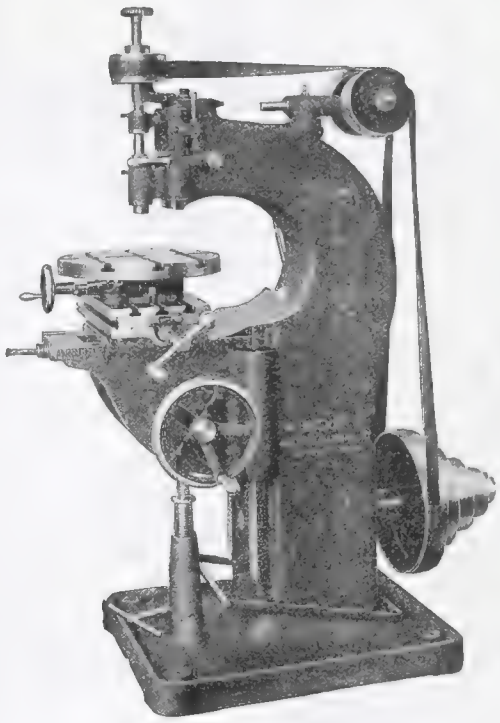

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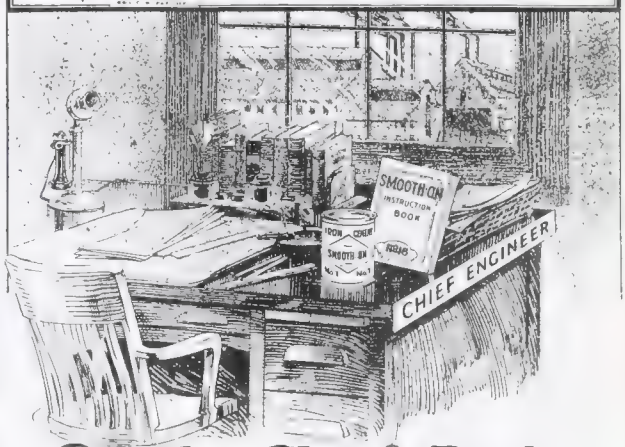

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MacKinnon Steel Co., Sherbrooke, Que.
Sheldons, Limited, Galt, Ont.

KNIFE GRINDERS
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LABELS AND TAGS
Matthews, Jas. H. & Co., Pittsburgh, Pa.

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Northern Crane Works, Walkerville.

LACING MACHINES
Clipper Belt Lacer Co., Grand Rapids, Mich.

LAG SCREW GIMLET POINTERS
National Machy. Co., Tiffin, Ohio.

LATHES, CHUCKING
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Wood Turret Machine Co., Brazil, Ind.
Williams & Wilson, Limited, Montreal, Que

LATHE CHUCKS (SEE CHUCKS)

LATHE DOGS AND ATTACHMENTS
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Curtis & Curtis Co., Bridgeport, Conn.
Hendey Machine Co., Torrington, Conn.
Williams & Co., J. H., Brooklyn, N.Y.

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LATHES, BORING
Bridgeford Mach. Tool Wks., Rochester, N.Y.
Williams & Wilson, Limited, Montreal, Que.

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Blount, J. G., & Co., Everett, Mass.
Canadian Fairbanks-Morse Co., Montreal.
The Geo. F. Foss Mchy. & Supply Co., Montreal.
Garlock-Walker Machinery Co., Toronto, Ont.
Hardinge Bros., Chicago, Ill.
New Britain Mach. Co., New Britain, Conn.
Pratt & Whitney Co., Dundas, Ont
Seneca Falls Mfg. Co., Seneca Falls, N.Y.
Williams & Wilson, Limited, Montreal, Que.

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Roelofson Machine & Tool Co., Toronto, Ont.

LATHES, BRASS
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Hardinge Bros., Inc., Chicago, Ill.
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LATHES, ENGINE
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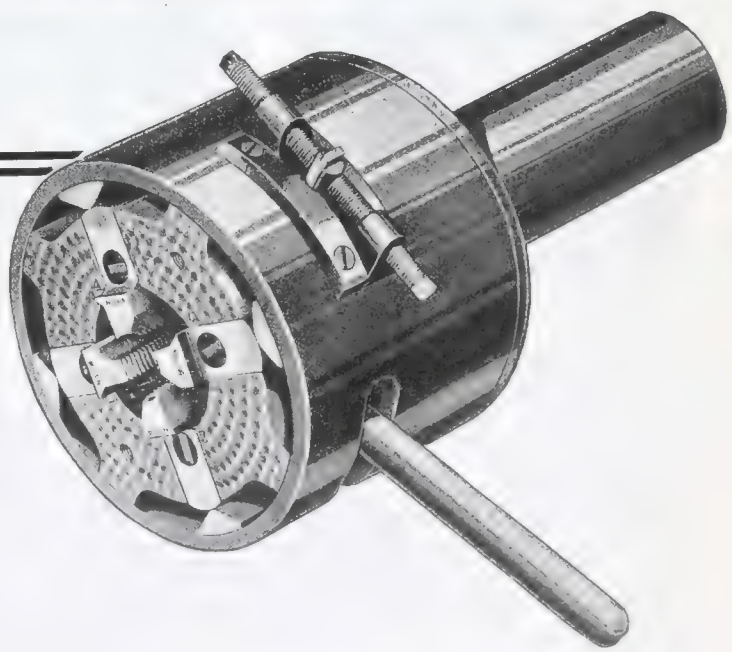

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Sidney Tool Co., Sidney, Ohio.
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Garlock-Walker Machy Co., Toronto, Ont.
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Foster Machine Co., Elkhart, Ind.
Garlock-Walker Machy. Co., Toronto, Ont.
Hardinge Bros., Inc., Chicago, Ill.
Wickes Bros., Saginaw, Mich.
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Niles-Bement-Pond Co., New York.
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Foster Machine Co. Elkhart, Ind.
Garlock-Walker Machy. Co., Toronto, Ont.
Gisholt Machine Co., Madison, Wis.
Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Bros., Inc., Chicago, Ill.
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Mullmer-Enlund Tool Co., Syracuse, N.Y.
National-Acme Co., Cleveland, Ohio.
Niles-Bement-Pond Co., New York.
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Williams & Wilson, Ltd., Montreal, Que.

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MACHINERY, TRANSMISSION (POWER)
Morse Chain Co., Ithaca, New York.

MACHINES, BELT-LACING
Clipper Belt Lacer Co., Grand Rapids, Mich.

MACHINES, RUNNING, BALANCING
Norton Grinding Co., Worcester, Mass.

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MacGovern & Co., Montreal, Que.
Starrett Co., L. S., Athol, Mass.
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Williams & Wilson, Limited, Montreal, Que.

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Williams & Wilson, Limited, Montreal, Que.

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Matthews, Jas. H., & Co., Pittsburgh, Pa.

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Williams & Wilson, Limited Montreal Que

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Strong, Kennard & Nutt Co., Cleveland, Ohi

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MEASURING TAPES AND RULES
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METERS
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METERS, WATER
Can. Cartridge Co., Hamilton, Ont.

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Wells Bro. of Can., Galt, Ont.

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Brown & Sharpe Mfg. Co., Providence, R.I.
Canada Machinery Corp., Galt, Ont.
Cincinnati Milling Machine Co., Cincinnati.
Ford-Smith Mach. Co., Hamilton, Ont.
Fox Machine Co., Jackson, Mich.
Hardinge Bros., Inc., Chicago, Ill.
Hendey Mach. Co., Torrington, Conn.
Hinckley Machine Works, Hinckley, Wis.
Kearney & Trecker Co., Milwaukee, Wis.
Kempsmith Mfg. Co., Milwaukee, Wis.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., Dundas, Ont.
Taft-Peirce Mfg. Co., Woonsocket, R.I.
Williams & Wilson, Limited, Montreal, Que.

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Bilton Mach. Tool Co., Bridgeport, Conn.
Betts Machine Co., Rochester, N.Y.
Williams & Wilson, Limited, Montreal, Que.

MILLING CUTTERS
Cleveland Milling Machine Co., Cleveland, O.
Kearney & Trecker Co., Milwaukee, Wis.
Williams & Wilson, Limited, Montreal, Que.

MILLING MACHINES, HAND
Bristol Machine Tool Co., Bristol, Conn.

MILLING MACHINES, THREAD
Gisholt Machine Co., Madison, Wis.
Hardinge Bros., Inc., Chicago, Ill.
The Gray Ball Bearing Co., Ltd., Toronto.
United States Mach. Tool Co., Cincinnati, Ohio.
Pratt & Whitney Co., Dundas, Ont.
Williams & Wilson, Limited, Montreal, Que

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Bristol Machine Tool Co., Bristol, Conn.
Brown & Sharpe Mfg. Co., Providence.
Bertram, John, & Sons Co., Dundas Ont.
Canada Machinery Corp., Galt, Ont.
Ford-Smith Mach. Co., Hamilton, Ont.
The Geo. F. Foss Mchy. & Supply Co., Montreal.
Fox Machine Co., Jackson, Mich.
Garlock-Walker Machinery Co., Toronto, Ont.
Gooley & Edlund, Cortland, N.Y.
Hardinge Bros., Inc., Chicago, Ill.
Kearney & Trecker Co., Milwaukee, Wis.
Kempsmith Mfg. Co., Milwaukee, Wis.
R. K. LeBlond Mach. Tool Co., Cincinnati, Ohio.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., Dundas, Ont.
United States Mach. Tool Co., Cincinnati, Ohio.
Whitney Mfg. Co., Hartford, Conn.
A. R. Williams Machy. Co., Toronto.
Williams & Wilson, Limited, Montreal, Que

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Becker Milling Machine Co. Boston, Mass.
Bilton Mach. Tool Co., Bridgeport, Conn.
Brown & Sharpe Mfg. Co., Providence.
Canada Machinery Corp., Galt, Ont.
Cincinnati Milling Machine Co., Cincinnati.
Ford-Smith Mach. Co., Hamilton, Ont.
Foss, The Geo. F., Mchy. & Supply Co., Montreal.
Fox Machine Co., Jackson, Mich.
Garlock-Walker Machinery Co., Toronto, Ont.
Garvin Machine Co., New York.
Gooley & Edlund, Inc., Cortland, N.Y.
Hardinge Bros., Inc., Chicago, Ill.
Hendey Machine Co., Torrington, Conn.
Kearney & Trecker Co., Milwaukee, Wis.
Kempsmith Mfg. Co., Milwaukee, Wis.
R. K. LeBlond Mach. Tool Co., Cincinnati, Ohio.
Niles-Bement-Pond Co, New York.
Pratt & Whitney Co., Dundas, Ont.
Williams & Wilson, Limited, Montreal, Que.

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Can. Fairbanks-Morse Co., Montreal.
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Garlock-Walker Machinery Co., Toronto, Ont.
Garvin Machine Co., New York.
Pratt & Whitney Co., Dundas, Ont.
Williams & Wilson, Limited, Montreal, Que

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Sheldons, Ltd., Galt, Ont.

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A. R. Williams Machy. Co., Toronto
Williams & Wilson, Ltd., Montreal, Que.

MIXERS, SAND
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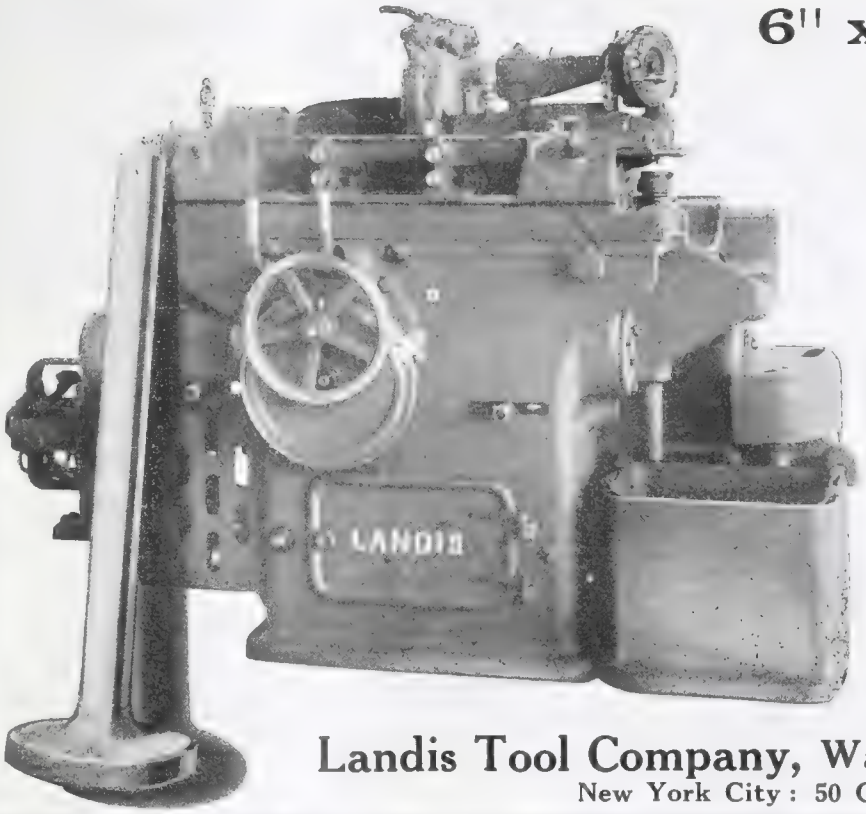

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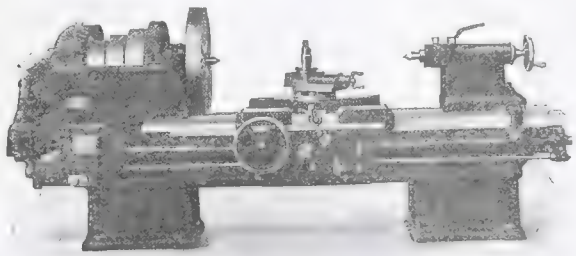

Specifications include 3-step cone, double back gear, semi-quick change gear lathe, built on 10 ft. bed. This lathe also furnished with quick-change gears. Bed lengths available: 10, 12, 14, 16, 18 and 20 feet.

The Sidney Line comprises 15-inch, 17-inch, 19-inch, 25-inch, 27-inch, 30-inch and 36-inch lathes, which are adaptable to the finest tool room work or the heaviest duty shipyard or factory rapid production work.

Heavy Duty Engine Lathes

The Sidney Tool Company, Sidney, Ohio

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The National Automatic Tool Co., Richmond, Ind.
MULTI-BORING MACHINES
The National Automatic Tool Co., Richmond, Ind.
MULTI-TAPPING MACHINERY, VERTICAL AND HORIZONTAL
The National Automatic Tool Co., Richmond, Ind.
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United Brass & Lead Ltd., Toronto.
Wilkinson & Kompass, Hamilton, Ont.
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National Machy. Co., Tiffin, Ohio.
NUT MACHINES (HOT)
National Machy. Co., Tiffin, Ohio.
NUT FACING AND BOLT SHAVING MACHINES
Garvin Machine Co., New York.
National Machinery Co., Tiffin, Ohio.
Victor Tool Co., Waynesboro, Pa.
Williams & Wilson, Limited, Montreal, Que.
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Garvin Machine Co., New York.
Greenfield Tap & Die Corp., Greenfield, Mass.
Hall, J. H., & Son, Brantford, Ont.
A. B. Jardine & Co., Hespeler.
Landis Machine Co., Waynesboro, Pa.
National Machinery Co., Tiffin, Ohio.
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Norton Co., Worcester, Mass.
Rice Lewis & Son, Toronto, Ont.
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Brantford Oven & Rack Co., Brantford, Ont.
MacKinnon Steel Co., Sherbrooke, Que.
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Carter Welding Co., Toronto, Ont.
Prest-O-Lite Co., Inc., Toronto, Ont.
St. Lawrence Welding Co., Montreal, Que.
Welding & Supplies Co., Montreal, Que.
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Carter Welding Co., Toronto, Ont.
Prest-O-Lite Co., Inc., Toronto, Ont.
Turner Brass Works, Sycamore, Ill.
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Cleveland Wire Spring Co., Cleveland.
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Graton & Knight Mfg. Co., Worcester, Mass.
William R. Perrin, Ltd., Toronto.
PANS, WET AND DRY
Frost Mfg. Co., Chicago, Ill.
PAPER MILL CONVEYORS AND DRIVES
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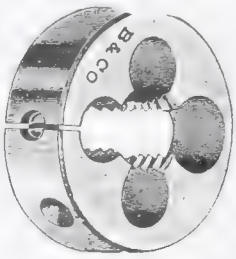

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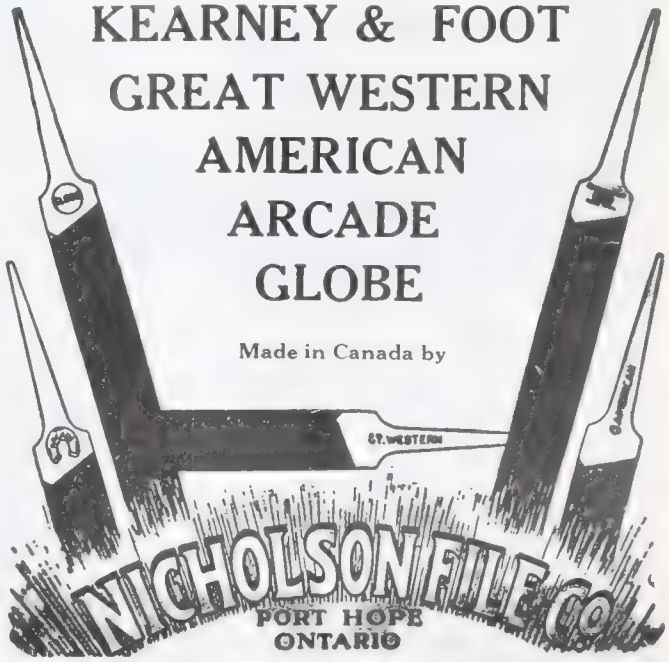

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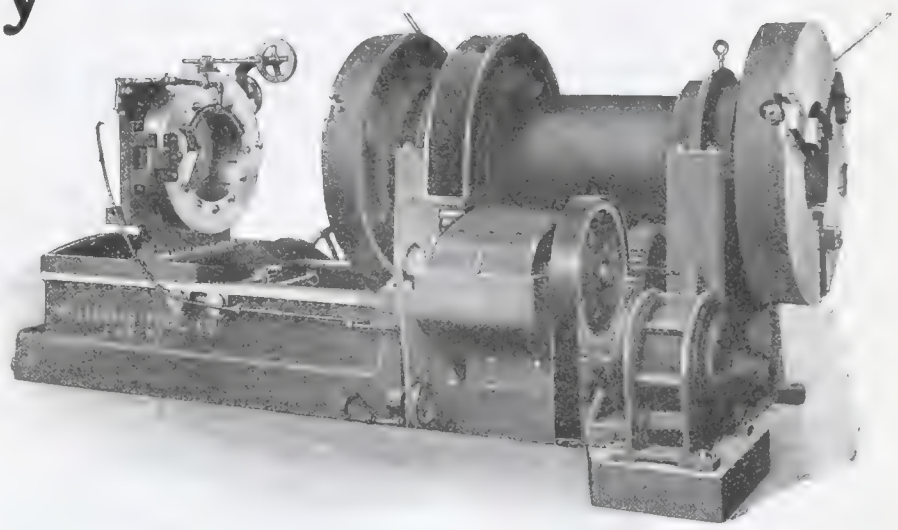

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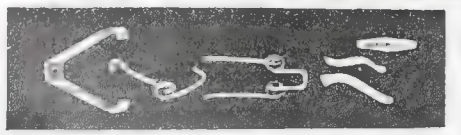

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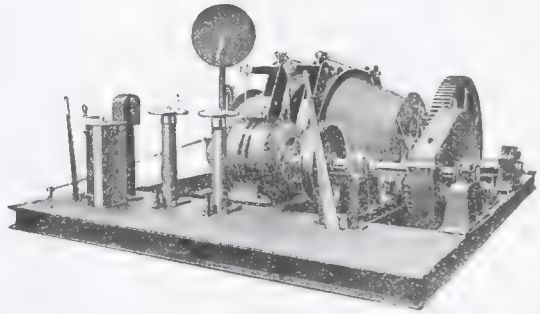

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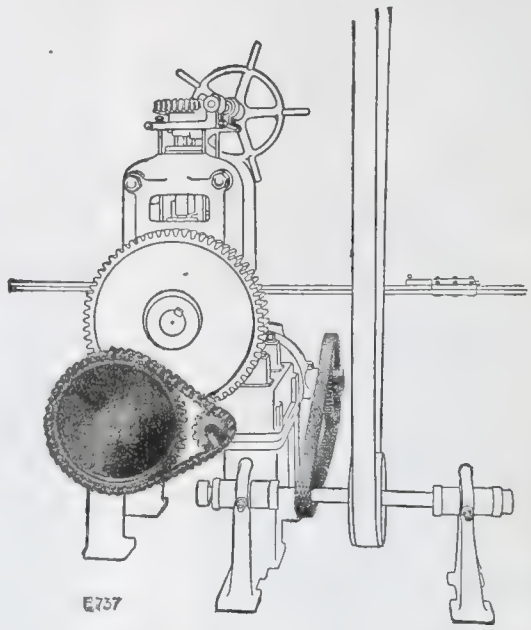

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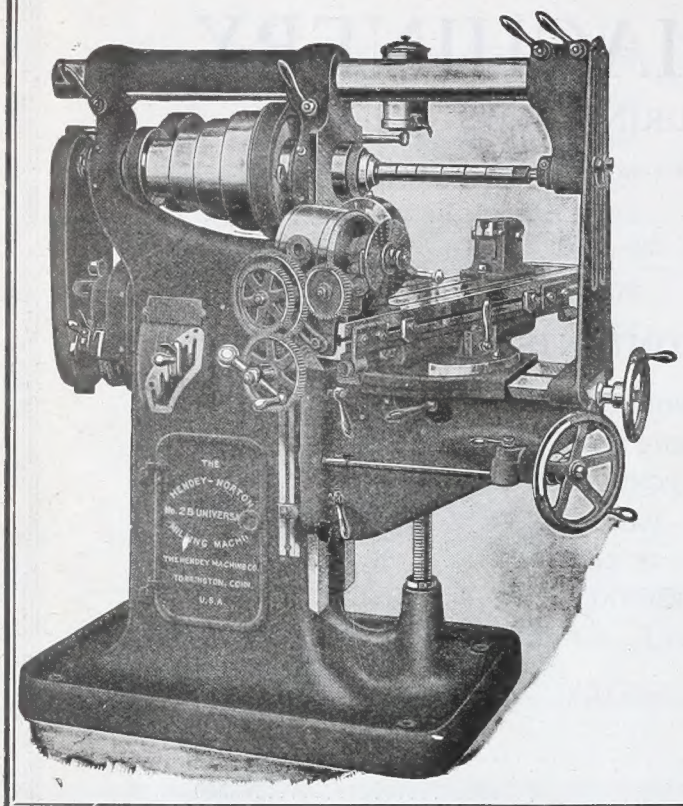

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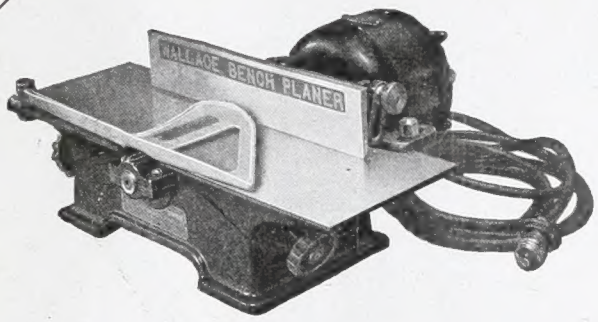

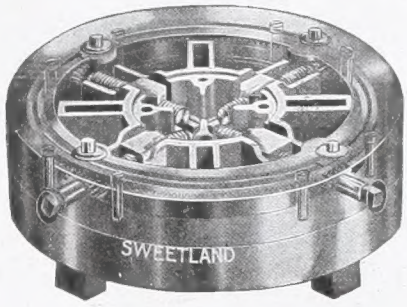

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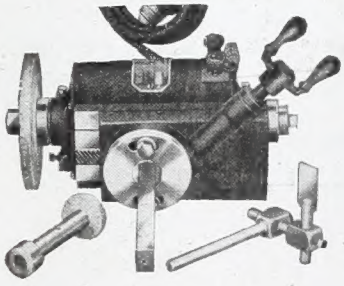

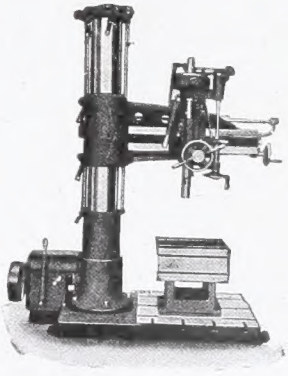

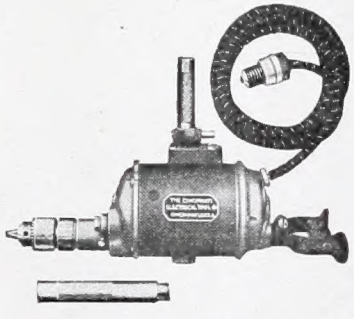

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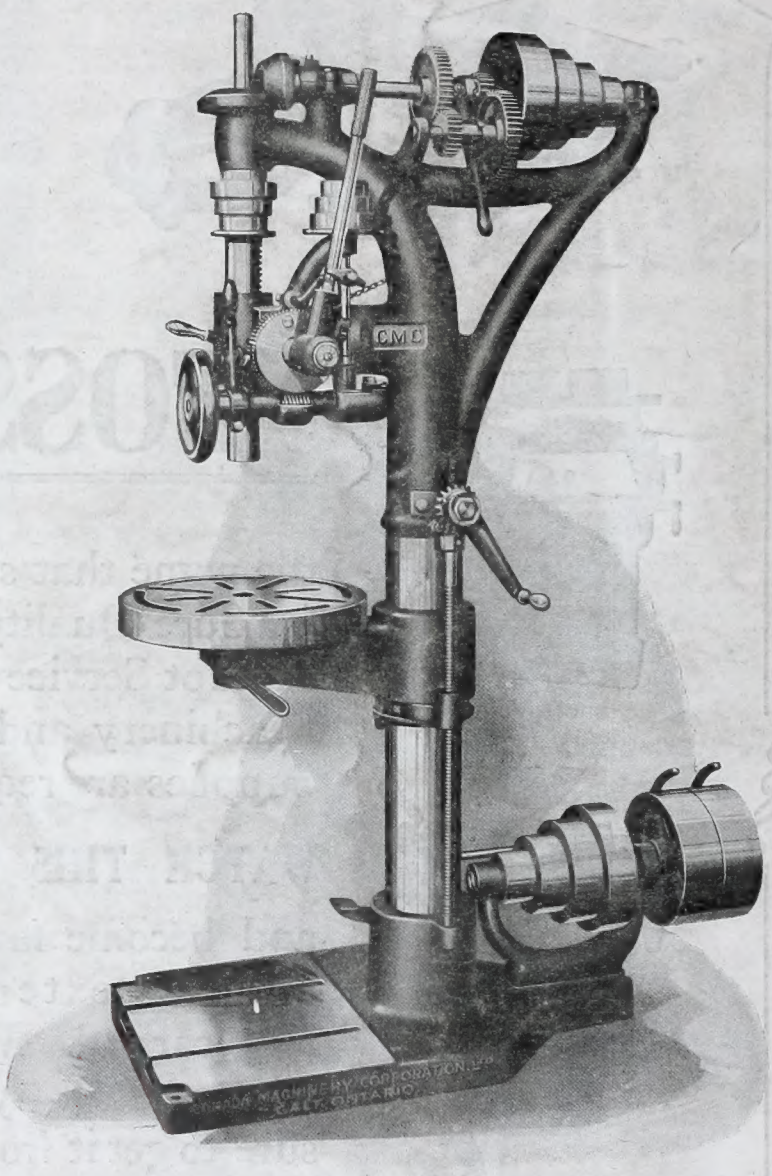

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